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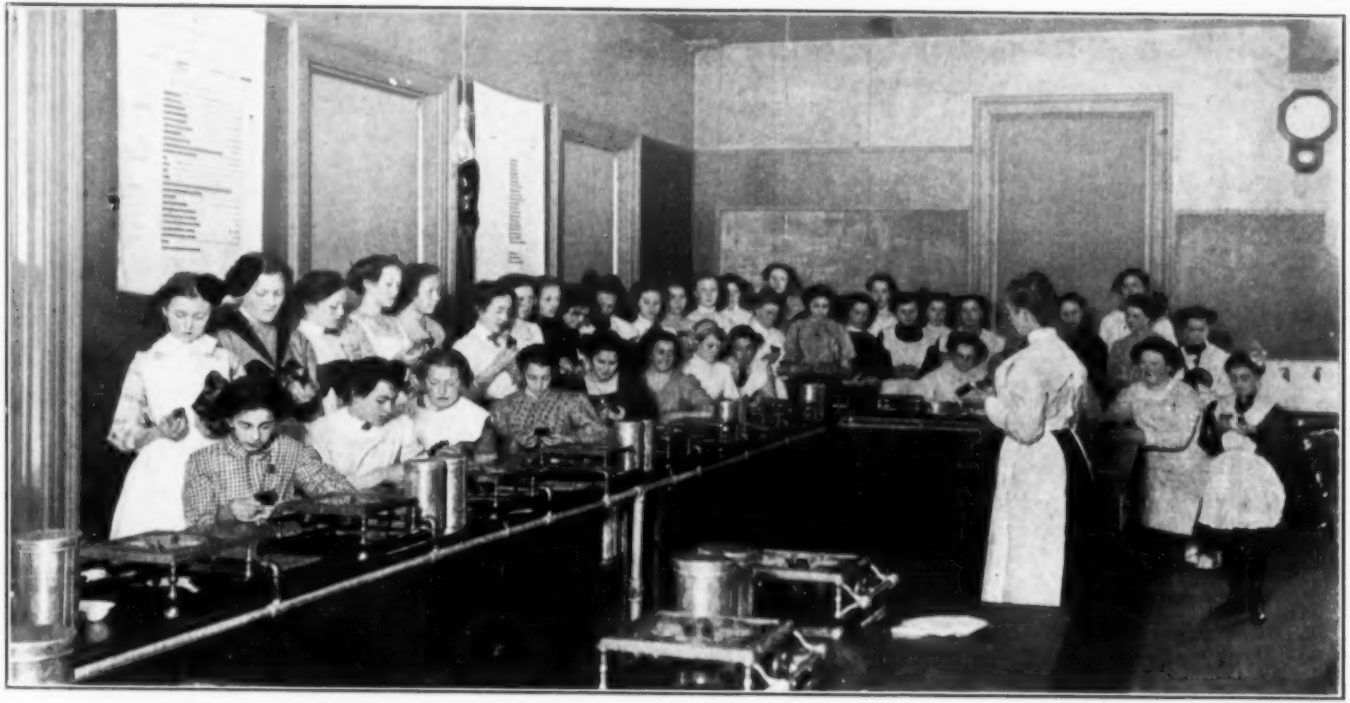

Rural Schools of Minnesota: Class of Girls Judging Cakes after a Lesson.

THE
Journal of Home Economics

VOL. III. DECEMBER, 1911 No. 5

COLLEGE COURSES IN HOME ECONOMICS.[1]

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Our opinion of the proper scope and purpose of college courses in Home Economics will be materially affected by what we consider to be the true function of the college. On this point educators are as yet far from agreement. It is true that we are now in the midst of a movement to standardize the college as regards its requirements for both entrance and graduation. For this purpose an effort is being made to fix the pedagogical value of different subjects and courses and to express this in "units" or "credits." Obviously the exact determination of pedagogical values is very difficult. The results of educational standardization must therefore be considered as thus far comparatively crude and unsatisfactory. There is, however, little doubt that much good will result from the attempt to define educational standards. We shall at least have some definite points around which the discussion of educational values may be focused.

Meanwhile, discussion of the college is covering a wide range. At one extreme are those who hold that the college should devote itself to the promotion of intellectual activity in a broad and liberal way but without reference to the life work which lies before the student after graduation. Their argument runs somewhat as follows: After the rigid and narrow discipline of the secondary school, it is well that the youthful mind should survey the field of human knowledge, learn in a

[1] Presented at the San Francisco Meeting of the Education Section of the American Home Economics Association, July, 1911.

general way the course of development of thought and institutions through the ages, reflect upon his own nature and destiny, and seek to find himself in the world of nature and men. This is the best preparation youth in the later stages of adolescence can have for the more exact and practical studies which after-college days will introduce him to business or professional life and definitely prepare him for his vocation. And at the same time it will fit him to fill a large place in the social life of his times and to have much of mental satisfaction in both work and recreation.

At the other extreme are those who urge that amid the rapidly expanding limits of every branch of human knowledge and activity and the ever increasing exactions of vocational life, there is now no room for studies without definite aim and purpose. If the college has any place at all in our modern educational system, they say, it is to give training in those branches which are fundamental to the more practical knowledge required in the vocations, and this should be combined with studies directly relating to the vocations. The modern man will best get strength and breadth of intellectual power from the study and practice of the complicated and absorbing vocations for which higher education should fit him.

The truth is probably to be found between these two extremes and it is on this middle ground that the American college is more and more inclined to locate itself. Believing that man shall not live by bread alone, it will feed the youth on a more generous diet. Without neglecting the requirements for vocational success, it will train men with reference to their social activities and the refined pleasures of life. The broad development of body, mind, and spirit, and the specialization of function to meet the requirements of modern life are to be combined in the college course of the future.

We are apparently passing out of an era in which the scheme of free electives has been tried in a revolt against the narrow and rigid curriculum of the old college. The effort now is to secure appropriate groupings of studies so that the real tastes and needs of individuals may be met without sacrificing either a proper balancing of cultural and vocational requirements or proper standards for the conferring of degrees.

The subjects taught in colleges have been greatly multiplied and yet the end of this movement has not been reached. The methods of presentation of various subjects have been greatly modified but there is yet room for much improvement. The effort to secure a proper

grade of work in the college has been productive of great good and should be continued. The fear of lowering the intellectual strength of the curriculum or giving the lazy student the aid and comfort of "soft" courses has, however, led the college teacher to insist in some respects too strongly that all courses should have a relatively high pedagogical value. The natural desire of the college teacher to train students to be experts in his subject has often led to the ignoring of the just demands of those students pursuing a subject for a more general purpose. Certain subjects, *e.g.*, music and the fine arts, have been unjustly kept out of college courses because it was held to be too difficult to frame proper college courses in them or it was feared that they would be studied without serious purpose.

It is therefore necessary to plead for a broader study of the college curriculum with reference to actual requirements of students between the ages of eighteen and twenty-two years. With a careful weighing and grouping of studies, it will be possible to maintain a sufficiently high total of intellectual accomplishment for the course as a whole and yet permit the student to take certain courses for general information, or to gratify aesthetic or other tastes. We are beginning to see that a suitable time given to physical training and instruction in personal hygiene is not beneath the dignity of the college. In like manner training which will contribute to social amenities and personal accomplishments will ultimately be provided for.

Broadly speaking, college courses for women have followed too closely the lines laid down in those for men or have been drawn on the presumption that college women as a rule intended to pursue professional careers. The rôle of woman in the home and society, or as a dispenser of hospitality and a leader in the refined pleasures of life, has been too much neglected by the colleges of the better class.

These general considerations have a vital bearing on the problem of college courses in Home Economics. To them must be added considerations, also of a somewhat general character, which relate more directly to the subject of Home Economics itself.

To gain its rightful place in the modern educational system, Home Economics must be made a definite, that is a limited, subject, the scope and purpose of which can be fairly differentiated. As long as Home Economics is indefinitely considered as covering most if not all the work of a woman's department in a college or is broadly and loosely described as the science and art of right living, it will be difficult to make people understand why it should have any separate existence.

The fact that Home Economics derives its materials from a variety of arts and sciences is no argument against its independent existence. The same is true of many complicated educational subjects, *e.g.*, medicine, agriculture, and engineering.

The fact that at present there is much variety of opinion in detail as to what should be included in Home Economics need not prevent definition of the subject for practical purposes. Under such conditions it seems best that the standard definition should embrace only those subjects which it is generally agreed are included in the term. If later on general agreement to include other subjects is reached, the definition can be amended to include them. It is such considerations which have recently led committees constituted in a somewhat authoritative way to agree on a limited definition of Home Economics as a basis for further study and development of the subject. This definition, as formulated by committees of the American Home Economics Association and the Association of American Agricultural Colleges and Experiment Stations, is as follows: Home Economics, as a distinctive subject of instruction, includes the economic, sanitary, and aesthetic aspects of food, clothing, and shelter as connected with their selection, preparation, and use by the family in the home or by other groups of people.

Having this definition, it will be fortunate if there shall follow a general effort to formulate and strengthen courses of instruction and lines of research within these limits. The production of manuals, text-books, laboratory devices, and illustrative material along this line, together with the instruction of many students according to this program, will do much within a comparatively short time to give Home Economics an assured place and standing in the educational institutions from the university down and to bring legislators, philanthropists, and the general public to its support. When all this shall have been done, there will be time enough to consider the enlarging of the borders of the subject.

It is also very important at this stage of the development of Home Economics that it should be defined and explained in simple and homely terms. Attempts at the allegorical or transcendental treatment of the subject or the development of fanciful systems will only tend to convince the learned and unlearned alike that Home Economics is after all a fad.

College courses in Home Economics should be planned with reference to the conditions prevailing in the preparatory schools. At pres-

ent relatively few students will have had opportunity to study Home Economics before coming to college. It is therefore very desirable that the student have the opportunity to begin this subject in the college. The college course for beginners should take into account the relative maturity of the college student and therefore carry her more rapidly over the elementary practical work and combine with this from the beginning the more scientific elements. At entrance to college, credit should be given for Home Economics properly pursued in the preparatory school and thus the study of Home Economics in the secondary schools will be greatly encouraged.

Until Home Economics is generally taught in elementary and secondary schools, the colleges will be obliged to meet the needs of those students who desire to begin this subject in the college and at the same time provide suitable courses for those prepared in this subject in the lower schools. This creates an awkward situation when the number of instructors or students is very limited. When a sufficient number of students elect Home Economics to make possible the division of the class into sections, the problem becomes easier.

Courses in Home Economics should be offered for college women who desire to pursue them as a part of a course of general education and to fit themselves to manage homes and meet the general requirements of social life. These courses should be planned with reference to the actual conditions of home and social life and include both practice and theory. Such courses should be allowed to form a part of a general bachelor-degree course, that is without requiring the student to graduate in Home Economics.

Besides these more elementary and general courses of Home Economics, the colleges should offer special courses suited to the needs of those students whose major interest is in Home Economics and who are looking forward to professional careers in this line, as teachers, experts, nurses, dietitians in sanatoriums or public institutions, managers of hotels or of boarding departments of schools, public institutions, etc. The number and variety of such courses will depend on the funds at the disposal of the college for the Home Economics department, the number of instructors, and the consequent specialization of their work. Those courses should be first established for which there is the greatest demand and the institution with limited funds should seek to give the strongest courses it can in one or two lines rather than to spread weakly out over a large field.

To indicate how Home Economics may be introduced into a college

course arranged on the group plan, the following courses have been outlined. The number after each subject indicates semester credits, the total number of credits for the course being 130. Many other combinations of studies could of course be made. The first of these illustrative courses lays emphasis on languages, the second on sciences, and the third on Home Economics.

College Courses for Women.

GROUP I. (LANGUAGES.)	GROUP II. (HISTORY, ETC.)	GROUP III. (MATHEMATICS AND SCIENCES.)	GROUP IV. (ARTS.)
Course 1.			
English.....20	History.....10	Mathematics..6	Music or Drawing.....*10
Latin.....10	Psychology.....10	Physiology.....4	
French or German.....20		Biology.....10	Home Economics.....20
		Chemistry.....10	
50	20	30	30
Course 2.			
English.....10	History.....15	Mathematics...6	Music or Drawing.....10
French or German.....20	Economics.....5	Physiology.....4	
	Psychology.....10	Biology.....10	Home Economics.....20
		Chemistry.....20	
30	30	40	30
Course 3.			
English.....10	History.....10	Mathematics..6	Music or Drawing.....10
French or German.....10	Psychology.....10	Physiology....4	
	Education.....10	Biology.....10	Home Economics.....40
		Chemistry.....10	
20	30	30	50

*The course in music or drawing might well include the history of music or the fine arts, as well as training in the art itself.

There will always be a variety of opinion in the case of such subjects as Home Economics, agriculture, engineering, or medicine, as to what should be taught under those heads and what should be left to the teachers of the fundamental sciences, such as chemistry, biology, etc. The problem is to work out what is desirable in the combination of theory and practice in Home Economics and then have the teachers of Home Economics give the instruction in the body of knowledge assembled under that head. There will be more or less overlapping at best, though pains should be taken to keep this down to a desirable

minimum. The chemist, for example, will teach many of the principles on which the art of cooking depends, but he will do this from the standpoint of the chemist. The teacher of Home Economics must develop the whole theory of cooking as directly related to the art and present both the theory and the art as a systematic whole. In doing this she should take advantage of the previous training of the students in the fundamental sciences and lead them to apply whatever scientific knowledge they have acquired, but she should not be deprived of the opportunity to present the scientific facts and principles underlying the practice. The point of view of the teaching and the proper combination of knowledge drawn from various sources, with a view to giving the student a rational practice, are the important factors in making strong courses in such subjects as Home Economics. We do not need to fear repetition as long as there is differentiation of purpose and aim in the instruction. We do not have enough of such repetition as will fasten scientific knowledge in the student's mind and make it usable in practical ways.

Home Economics also has its economic and sociological side and this should be developed in the college instruction in this subject. There will thus be a combination of facts and principles drawn from physical, biological, economic, and sociological sciences as related to the business and life of the home which, when properly assembled and arranged, will provide ample material for definite and well balanced college courses in Home Economics.

Under present conditions, the task of the college teacher of Home Economics is a very difficult and complicated one. By study and research she must assemble and enlarge a new body of knowledge and give it pedagogical form. She must prepare manuals, text-books, apparatus, and illustrative material in this new subject. She must fit Home Economics into college curricula which are in a rapidly shifting and largely chaotic condition. She must meet the requirements of collegiate standards in the intellectual and scientific strength of the Home Economics courses and at the same time overcome the narrow and false views of college pedagogics which oppose the introduction of the practical into college courses. She must meet the growing demand of the public that something shall be done to give women practical training for their life work, but she must stoutly resist the claims of those who would confine Home Economics to the merely empirical. At the same time she must tactfully oppose those faddists and sentimentalists, who, while honestly claiming to be the friends of

Home Economics, would really sap its scientific and practical foundations.

Besides giving sound and thorough instruction to her college students, she must do a large amount of propaganda work to secure the general recognition of Home Economics in the elementary and secondary schools, and all she can of that broader extension work by which the multitudes of untrained women in the homes are to be encouraged and inspired.

The college teacher of Home Economics needs, therefore, in unusual measure the aid of all intelligent people and particularly of the leaders of public opinion and the managers of educational institutions. College boards, presidents, and faculties especially should give earnest and sympathetic study to the problems involved in the development of strong courses in Home Economics and their adjustment to the complicated program of the modern college. Careful study of this matter will, I believe, constantly enhance the importance of Home Economics as a part of a well rounded and adequate scheme of college education for women.

A FOUR-INCH LESSON IN HEALTH AND ECONOMY.[1]

S. Maria Elliott.

Simmons College.

Important principles often depend upon facts that can be shown by very simple experiments. Knowledge gained through the senses, is "knowledge that sticks," and perhaps none is so firmly fixed as that gained through the eye. The lessons in bacteriology to be taught from a four-inch dish with its thin layer of prepared jelly may be presented with almost as much value to the child of five as to the adult observer. Emphasis may be put wherever the need is greatest.

The child of five may expose the prepared "soil" cover and watch with absorbing interest the changes that take place. The adult is possibly even more interested and impressed. (The older pupil should prepare the "soil" and thereby learn the lesson of minute bacteriological cleanliness.)

[1] Read at the San Francisco Meeting of the Education Section of the American Home Economics Association, July 14, 1911.

When spots appear upon the surface of the formerly clear jelly the natural question "why?" will suggest answers that are lessons which every human being should learn for his own safety and comfort. With a little guidance, these conclusions are easily drawn. The open dish caught something from the air. This something was invisible. It grew; therefore, it must have been alive. There are spots of different shapes and colors. There must be different causes. Around some of the spots, changes occur, hollows form, liquid gathers—evidently these spots of living matter have power to change the jelly on which they were caught. This is a good chance for applied chemistry, as well as for bacteriology. It needs only a word to fix the facts that in dust there are invisible, living cells that use favorable soil and grow, producing changes in this soil, which is their food. The vile odor that will be present after some days of growth will prove most effectively the cause and conditions of putridity and the necessary measure of prevention.

The fundamental biological facts are easily grasped. If the experiment is always spoken of as a "dust garden," there is no difficulty in fixing the fact that these invisible cells in the dust are of plant, not of animal origin.

Let one dish be planted from still air. Note how few cells are caught. Why should the clothes worn in churches, halls, and other dusty places be so thoroughly cleaned, preferably out-of-doors? Why should some time elapse after they are brushed, if in the house, or after sweeping, bed-making, or other dust-spreading processes are carried on, before true dusting can be effective? The advantage of cleaning clothes out-of-doors, or better, the ideal principle of suction for the drawing out of all dust and its disposal by burning will be readily grasped.

The relations of living matter to light, temperature, and moisture can all be taught by placing one dust garden in the dark and one in the light, one in a refrigerator and one at the ordinary room temperature, or in an especially warm place.

The importance of fresh air, the healthfulness of sunlight may be strongly emphasized. If one garden be planted with spatters of saliva or mucus from the nostrils, the lesson can be taught that coughing and sneezing should be with closed mouth, covered nostrils, or averted head. Were such lessons given in all the schools, it is not too much to hope that before the end of the twentieth century, America would lose its shameful name of "a nation of spitters." Before

the end of the century, we might hope to eradicate the habit of making the mouth a third hand, to hold money, pins, and pencils.

Hygienic habits in the children will bring universal health conditions years sooner than statutes and laws. Health is an asset and a fundamental factor in economy. Therefore, all health-habits may be considered equally important from an economic standpoint. But, aside from health, an aim sometimes so far distant or indirectly attained that it does not furnish a daily incentive to correct hygienic teaching, there may be close, direct application to the care and preservation of food and clothing.

The housewife who sweeps her kitchen floor and immediately begins to can her fruit, is committing an offense against economics, as well as bacteriological laws. The closely covered warm milk, the tightly wrapped hot bread, the close, tight cheese dish, all encourage the quick growth of mold or bacteria and the consequent lessening of value or the complete loss of food, with the possible formation of ptomaines or poisonous products. The mold and pores on the tightly rolled clothes in the laundry basket or the bacteria on the damp dishcloth or mop hung in the dark cupboard will follow the laws of development as surely as the voracious caterpillar will come out from the moth's egg. There is a cause for every effect. The youngest student may observe the effect and may be led toward the cause, thereby learning prevention, which is sanitation.

All these phenomena underlie the common daily facts of life and living. If once observed, there never again can be the same ignorance or carelessness in personal habits and in our relations with our fellows, both from the standpoint of prevention of illness with its economic waste, and with the preservation of food materials.

There cannot perhaps be found an experiment so simple in preparation, so suggestive in observation, so important in its applications as the one we have outlined.

HOME ECONOMICS FROM THE STANDPOINT OF THE GRADE TEACHER.[1]

ALICE P. NORTON.

University of Chicago.

In the Cook County (Illinois) Normal School under Colonel Francis W. Parker a study of "foods" was carried on with children in the grammar grades as far back as 1893. The most common articles of food were used, and these were tested as to their composition, the amount of water in each, and the number containing starch, albumen, fats, and oils being determined. This was a preparatory step leading to a study of the kinds and quantity of food necessary to meet the daily needs of the individual. The problem presented was to select a menu for one day that would furnish the food necessary to repair the daily waste. The necessary statements and Atwater's tables formed the basis for the work.

This was a crude beginning, but the interest was sufficient to carry the work through with a fair degree of success. The class, working together and not as individuals, prepared menus which would meet the demands for repair of waste. In addition to the kind and amount of food needed, the cost of each article was considered. As a means of giving a more definite idea of the quantities necessary, they were modelled in clay. The relative size of the pat of butter for each meal made, for instance, a very distinct impression. To give a more comprehensive knowledge of the kind and variety of foodstuffs, an excursion was taken to the largest grocery store in the city. This opened the way to the study of place geography in locating the countries from which the various articles had come.

It may be objected that this must have been too scientific, as it had little application to the child's experience, and could have little far-reaching effect upon his own choice of food; since the menus were constructed from the standpoint of the adult's needs. But in this work

[1] Presented at the St. Louis meeting of the American Home Economics Association, December 27, 1910.

there were three desirable elements. There was good experimental work in testing food materials, which suggested the idea that some materials are more valuable as food than others. There was a constant use of mathematics for a definite purpose. There was growth in power to handle materials and apparatus, or in muscular control. Last of all there was training in responsibility in the maintenance of the laboratory to see that all materials were cared for properly and that the room and utensils were left in perfect order.

What the work lacked was the opportunity to prepare the menus, to cook and serve them. With this, it was agreed, the circle of experience needed to gain intellectual, physical, and social control would be complete, so far as this subject could give it. With a prophetic eye Mr. Jackman said confidently: "The time is near when cooking will be a part of the curriculum for our elementary schools."

In 1900, seven years later, an experiment was tried in the Chicago Normal School in what Dr. Colin A. Scott calls "self-organized work." This is reported in his book, Social Education.

Here an opportunity was given the children in two third grade schools to present a plan for some work they would like to do, stating how much time they would need to finish it and how they would accomplish it. They were to work in groups or each by himself for a half hour twice a week.

As a result, of the fourteen groups organized during the year three were cooking groups. The first one organized was formed of five girls and one boy. They had no equipment, but one girl brought an old gas oven, another a heater, and the group interviewed the principal to secure his permission to have an attachment made so they could use the gas. Notwithstanding they were organized to cook "just to eat," they were led of their own will to the study of city departments of administration, to experiments to distinguish between butter and butterine, to printing their recipes with rubber stamps, to bookbinding so as to obtain covers for their cook-books, to discussions of discipline when the boy failed to bring the materials assigned as his portion, to a study of mathematics to determine the cost of a cupful or spoonful when the articles were bought by the pound, and to a determination of what each child's share of the expense would be when the cost of the cupful or spoonful was known. Averaging is not always introduced into the third grade, but these children used the process correctly and easily after being once shown.

Another cooking group was composed entirely of boys. They said,

"We don't want to cook as these girls do. But if anyone should be sick in the house, then we should like to be able to cook something." They began with beef-tea. They, too, were led into experimenting, for they were told that beef-tea should not look gray when it is served as that shows that the albumen in the meat has become hardened and cannot be digested quickly. At the teacher's suggestion, they beat the juice out of some pieces of meat and compared it with the white of an egg.

The self-organized work of these two groups is full of suggestions for the grade teacher and the teacher in Home Economics today as to the many-sided development cooking may produce.

In October, 1905, a class of children of seventh grade age who had come together from many other elementary schools, was organized at the University of Chicago. Only a few of the class had been in the university elementary school. Some of the pupils were "over age," some were very young. Some showed excellent training in forming good habits; others seemed to lack much in habit-training in the right direction. What service could cooking render this grade in their development?

The work was so arranged that the class, with no distinction in regard to sex, spent ninety minutes in the laboratory the day they cooked. This gave time to prepare and cook the article, and have time for the equally important lesson, for this class, in washing dishes and leaving the room in order. The next lesson for the week was scheduled as "cooking science" and lasted one hour. This hour was given to an experiment necessary to clinch the point in the preceding cooking lesson, or prepare for the one following. Once more each week the class went to the cooking laboratory, this time to find the tables covered with blotting pads and equipped with writing materials. They proceeded to write up the week's work in notes or recipes—as well as it could be done in thirty minutes. Thus three hours each week were given to the solution of a very definite problem.

One part of the quarter's work was to prepare and serve a luncheon to the mothers of the children. This was a great event for this class, both from their point of view and that of the teachers. Coming with such a variety of school experience they lacked unity and class spirit, but this one big piece of work united them as nothing else could have done. The excellent opportunities for organization which were presented the teacher used to the best advantage in the cooking and serving of the luncheon. The boy who was apt to make a disturbance

in the kitchen because of his clumsiness was made head waiter. He filled this position with great dignity, alertness, and careful polite attention to details. He permitted no one else to assume the least responsibility in showing a belated guest to her seat and handing her a napkin. That piece of work was the first one for this boy that could be considered above criticism. He had an opportunity to reveal a power which his teachers little dreamed that he possessed. They began to see a solution of one problem in the class. The other children served the luncheon deftly and with a glow of pride. The mothers partook of the food with an equal pride in it and in the skill with which it was served to them by their children. The committee on dish-washing, or the "dirty-dish committee," faithfully performed its duties.

What service did the cooking give in solving the problem of helping each child, so far as possible, to have control of his powers and use them to the best advantage, or to use Dr. Dewey's words[2] to see that "the children day by day by their own activities move inevitably . . . . toward culmination of themselves?" We may summarize the benefits as follows:

(1) The cooking won their interest and led to their best efforts without the continual prodding of the teacher. (2) It gave an impetus to the idea that there is something worth while inherent in work. This idea was carried over to other subjects. (3) It trained in control, something which this class much needed. (4) It gave them excellent work in construction. The class got together the necessary materials and out of a barrel and some hay made a fireless cooker, in which the delicious boiled ham was prepared for the luncheon. (5) A trip to market to buy some of the articles for the luncheon opened their eyes to the sources of foodstuffs and the distances from which certain articles come. (6) The luncheon developed a class spirit and made possible good team work. Truly the cooking was of very great service.

Cooking was also found to aid mathematics. "The training of attention and judgment acquired in having to do things with a real outcome ahead," to quote Dr. Dewey again, develops an appreciation of other work which at first sight does not appear to have "real outcome ahead." In order to solve the problems in cooking, certain mathematical processes have to be mastered. This is a direct help to the grade teacher for there is then a real motive for mathematics. She

[2] Child and Curriculum, p. 39.

thus in turn gives valuable aid to the cooking and brings her class to a higher development in the subject than would be possible otherwise.

In an article in *Elementary School Teacher* (vol. viii) Miss Jessie P. Rich describes work in which the grade teacher coöperated with her to their mutual advantage. The third grade in their geography study had become interested in raisins. The children asked, "What are they?" "Where do they come from?" "How do they grow?" "What kind of grapes makes a good raisin?" When most interesting experiments had answered some of these questions, the children wished to make individual bunches of raisins. They began with one-fourth pound of grapes, and the results of the experiment showed that the four ounces of grapes produced one ounce of raisins. This was made the basis of the following problems:

What is the weight of grapes necessary to make one pound of raisins? To make one-half pound of raisins?

What weight of raisins can be made from one pound of grapes?

If the grapes cost 8 cents per pound, what is the cost of one pound of raisins? Why is there a difference between this cost and the cost of one pound of raisins at the store?

The trays in California hold 24 pounds of grapes. How many raisins are made from this amount? What is their value?

This work made necessary a mastery of the use of the scales and the table of pounds and ounces, as well as of multiplication. The grade teacher's outlines for the period contain the following suggestions: "Problems involving addition and subtraction are demanded in cooking; problems from cooking involve a review of liquid measure and simple fractions." "Multiplication is needed in recipes in cooking just now."

Another illustration of the relation between mathematics and cooking in the third grade was found in the making of grape juice. The following data were sent to the grade teacher: A 5-pound basket of grapes costs 20 cents. When 8 pounds of grapes were used by sixteen children, 16 cups of juice were obtained. The individual recipe was 1 cup of juice and $\frac{1}{2}$ cup sugar (costing 6 cents for 2 cups or 1 pound). The result was $4\frac{1}{2}$ quarts of canned grape juice. From this data the following problems were devised:

(1) Find the cost per child of the grape juice made.
(2) Find the cost for all.
(3) Find the cost per basket.
(4) Find the amount of grape juice per basket of grapes.

Later in the course this grade entertained their mothers at luncheon. The problems in mathematics were many, including reducing and multiplying the recipes used for the cake; the cost of food; lists of provisions with the cost of each article; and the actual cost of luncheon.

The raisins made in the fall were kept and used in the cake for this luncheon. So the children began with the raw product and followed it through the steps of the process to the finished product, an experience never to be forgotten.

There was a strong social value in the luncheon. The grade teacher's notes read as follows: "The children felt their responsibilities, responded pretty fully to the unusual stimulus, and steadied themselves constantly in order to carry out successfully their plans. The majority of the pupils were conscious of their enlarged social opportunities and were happy to serve their friends both individually and in groups."

Another interesting experiment in which mathematics played a part was tried in the fifth grade. The class were making jelly and wanted to find out two things: (1) How much sugar is needed, and (2) whether the amount of sugar used affected the cost of the jelly. The general opinion on the second question was that an increase in amount of sugar would result in an increased cost per glass of jelly. Miss Snow's article in *Elementary School Teacher* (vol. viii) gives the results of the experiment in nine individual reports. The following is one of them:

In making grape jelly the question came up of how much sugar to use, so we tried to find out by experiment. In the tests, each child used a different amount of sugar to half a cup of grape juice. I used 6 tablespoonfuls to ½ cup of grape juice and boiled it at 220° F. This made nearly one wineglass full of jelly.

Three-quarter basket grapes cost	$0.15
One-half cup grape juice cost	.01
One-half pound (1 cup) sugar cost	.02½
Six tablespoonfuls (⅜ cup) sugar cost	.00$\frac{13}{16}$

$1\frac{1}{14} = 1\frac{8}{112}$

$\frac{13}{16} = \frac{104}{112}$

1 $\frac{117}{112}$ or 2 $1\frac{5}{112}$ cents cost of jelly.

Each child grappled with the subject of common fractions and mastered it without really knowing it, because he was seeking to answer the question, "How much sugar shall I use to make jelly?" His result became part of the class results needed to answer the question definitely.

A comparison of these results showed that, starting with the same amount of juice, when no sugar was used there was ¼ cup jelly, and that the amount of jelly increased with the amount of sugar. The child who used equal amounts of sugar and juice had 1½ cups jelly or six times as much as the child who used no sugar.

From the good motive in mathematics came skill in manipulation, and speed and accuracy in the use of fractions. But above this there was presented in tangible form the idea of the value of each individual's work. Each pupil saw that it was necessary to the success of the experiment that he should carry through to completion carefully his part of the experiment and the mathematical computations. To the grade teacher here is one of the best helps toward growth in a community spirit which can be desired. When a child gets the idea that what he does is really valuable to the class and especially when he can see this himself without having to get the idea from his teacher's suggestion he is faced in the right direction and is steadied to put forth his best effort. Are we sensitive to the difference in the effect upon the development of the children of work performed under such a motive and work done for the selfish motive of trying to get the highest mark in the class? The cooking here puts a real value upon effort, one which the children appreciate and one which sends them to other problems in a healthful attitude, mentally and socially.

The culmination of the first quarter's work in cooking in the sixth grade is candy making for a sale, the proceeds of which are used for a picture or cast for the school room. Here again is a strong social motive which brings excellent results in effort.

Three kinds of mathematical problems arise in this work. The first is in connection with the thermometer. The children have used the Fahrenheit scale and now must become familiar with the Centigrade. They must understand that 180 points, called degrees, on one thermometer equal 100 points on the other. Enough problems are solved in the grade work to enable the pupils to change from one thermometer to the other readily.

The second problem is in connection with the boxes for the candy sale. These are made by the class, and are large enough to hold ½ pound. The dimensions of a box of the simplest rectangular shape are given. The class work out dimensions of different shapes but producing boxes of the half-pound capacity.

The third problem arises in determining (1) the cost of all materials used in making the candy; (2) the total amount received at the candy

sale; and (3) the net proceeds of the sale. When the proceeds have been expended in the picture or cast, the class have a visible expression of the result of their combined efforts. The picture goes with them through the elementary school, and then is returned to be an incentive to future sixth grades.

According to the present course of study mathematics in the seventh grade coöperates with the cooking, enabling the class to answer such questions as the following, after the preparatory experiments have been performed:

(1) Determine the amount of soda for a recipe using 1 cup molasses and 2 cups sour milk.

(2) Given the ratio of the weight of soda to the weight of cream of tartar, as 184:88:

(a) What proportion of baking powder is soda?

(b) What proportion of baking powder is cream of tartar?

(c) Which gives the more gas, 1 teaspoonful of soda or 1 teaspoonful of baking powder? How may we prove this? Prove it mathematically.

(d) In a recipe calling for two teaspoonfuls of baking powder will ½ teaspoonful of soda be a substitute as regards the gas given off? (One cup only of sour milk is called for.)

Here again is opportunity for mutual coöperation between the cooking and the grade teacher's work to the advancement of the work in each department. With this coöperation the children should reach the eighth grade fully equipped mathematically to solve all problems arising. The grade teacher however, needs, the recipe work to supplement her work if the class is weak in mathematics.

This paper emphasizes the aid mathematics receives from cooking, but it is no less true that place geography may receive an equal impetus from the work. A comprehension of the location of the sources of the various articles of food on our tables daily will demonstrate clearly that the whole world is brought to our doors. An excursion to a wholesale grocery store where the articles are seen in original wrappings seems an essential somewhere in the course.

Ruskin's words are of interest here:

"Cookery means the knowledge of Medea and of Circe and of Helen and the queen of Sheba. It means the knowledge of all herbs and fruits and balm and spices, and all that is healing and sweet in the fields and groves and savory in meats. It means carefulness and inventiveness and willingness and readiness of appliances. It means the economy of your grandmother and the science of the modern

chemist; it means much tasting and no wasting; it means English thoroughness and French art and Arabian hospitality."

This once accepted as the content of the subject, the grade teacher believes in it for what it does for the children. Some of the results may be summarized as follows:

(1) It furnishes opportunity for training in motor control such as is found in no other subject. This is valuable to all children and especially necessary to children weak in this direction.

(2) It teaches some knowledge of elementary science.

(3) It gives a better appreciation of the work done in the daily routine in the home. Dr. Dopp says, "No better means are available for assisting the child to understand the complex industrial organization of the present than to give him experience in some of the fundamental processes." Among the half hundred boys in a camp in the Wisconsin woods last summer was one who had grown to the age of sixteen surrounded by all the attention and attendants wealth could supply, but shielded from all kinds of manual work. He had received his education from tutors and so had missed the advantages which schools offer to give experience in the cost and time of the daily preparation of food for the family needs. At the camp he became much interested in dishwashing and it was a great revelation to him. Day after day he went to the kitchen and wiped dishes for an hour, interested to see the great piles of dishes pass through the process which left them in place on the shelves. He expressed great surprise that it took so much time each meal to care for the dishes. He asked about the preparation of the meal and with surprise inquired, "Does it take all that time and work?" The child who has had cooking at school knows with appreciation something of the cost of preparation of food at home.

(4) Cooking fits the children to be of social value in the home. With what joy did a sixth grade boy offer to bake a cake for the birthday party of the friend he was visiting. What pleasure comes to the child and the mother if he or she can get a meal when emergency arises, or can set the table or serve the meal. Dr. Scott would make this the opportunity for moral training when he says, "Moral training is but the subjective side of service to society."

(5) Cooking furnishes excellent motives for work in mathematics, geography, and composition.

(6) Cooking gives an opportunity for those children who are strong in practical lines and have good motor control, but who are weak in

history, geography, or mathematics, to measure up with their fellows. By the old methods and opportunities the child who could not memorize easily, write good papers, or work difficult mathematical problems, was too often made to believe he was far below his classmates, in all points. That child, if of a practical turn of mind, often surpasses the good book student in cooking. Last week when the general work of an eighth grade boy had been declared a failure, the cooking teacher said, "He is doing the best work in the class."

In short, the problem of the grade teacher and the teacher in cooking is the same: To lead them into the fullest possession of their powers; to help them "day by day to move inevitably toward the culmination of themselves." The watchword should be "coöperation."

THE APPLICATION OF SCIENCE TO THE HOUSEKEEPER'S DAILY PROBLEMS.[1]

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Home Economics workers of the "advance guard" have always considered the housekeeper a part and parcel of the problem in establishing Home Economics on a sound educational basis, but there has been little time or energy to spare for a prolonged consideration of her daily problems. Now that the pedagogical side of Home Economics is comparatively firmly established and well developed, it would seem as if the time were ripe for rendering assistance to the housekeeper. Therefore, the application of science to the housekeeper's daily problems will probably be attained, first, through the education of future housekeepers in science, and secondly, through investigational work in connection with the Home Economics departments in our colleges.

Educators have labored and finally converted others to the belief that there is as much mental discipline to be obtained from the practical application of science to problems in life as there is to be obtained from Latin or pure physics. There never has been any question in the West but that the education of woman for her position in the home or for an occupation stood in as dignified a position as the education

[1] Read at the San Francisco Meeting of the American Home Economics Association, July 13, 1911.

of the boy for his position as engineer, farmer, teacher, or physician. As a result it is observed that although western education has had a comparatively short period of existence, the education of the future housekeeper in science is well provided for. The chemist teaches weighing in quantitative analysis by determining the moisture content in food and accurate methods of analysis through the analysis of food; and according to the newer methods of teaching organic chemistry, he ignores many of the compounds and derivatives to the advantage of the hydro-carbons and carbo-hydrates. The botanist includes a study of plants used as food, and often digresses enough to allow a consideration of the textile fibres. The zoologist is eager and ready to include eugenics. The economist has always been in this practical procession, and it would not seem strange to see the mathematician join it soon. Thus the application of science to daily living is an established fact for the college girls who will be among the housekeepers of the future.

But the assistance which can be rendered housekeepers through investigational work seems somewhat more difficult to accomplish at present, because it necessitates a worker and ample means to do the work. The worker must have had thorough grounding in science in order to undertake the problem, and there are few women in the field at present who are thus well trained and who are not in demand for teaching. Those who are teaching and attempting to carry on experimental work will appreciate the truth of the saying that half a man in experimental work means a quarter of a man in the results obtained, and a quarter of a man means no man at all. I believe it is largely the fact that women have had only "quarter time" which has brought down upon them the criticism that women are inclined to dabble in experimental work. Therefore, the teacher of Home Economics finds it difficult to "squeeze in" experimental work with her teaching, and the time of the housekeeper is so broken that, although she may be well trained in science, she is wise not to attempt experimental work. Moreover, she has not the equipment. Then, too, since good work once accomplished should be made available for all, there should be a clearing house for such practical information when it is once obtained.

For example, in our western country districts where there is no gas, the fireless cooker has proved a boon to housekeepers. The principles upon which its efficiency depends are that the heat once acquired may be retained through insulation, and that many foods may be cooked

at a temperature below the boiling point. The Norwegians as early as 1867 used the cook box and later the Germans used their feather beds as insulators. In this country many insulating materials have been used, but by measuring accurately the temperature of the same quantity of starch solution packed in hay, excelsior, sawdust, newspaper, asbestos, hair, and mineral wool, it was found that mineral wool best conserved the heat. The minimum mass for satisfactory cooking was also determined and finally the question of economy in its use was considered and experimented upon. At the time this work was done, it proved economical of fuel, time, and energy only when used for those processes which require long slow cooking. Now, with the many improvements such as a cover to draw down quickly over the food while it is still boiling hot, or the introduction of hot iron plates into the cooker, it has been made even more economical. The results of this detailed work would be of use to the housekeeper.

Again, in this age of scientific management, it seems to me that the economic side of a problem is of as much importance as the scientific. Louis F. Brandeis, in his work with the railroads, and Mr. and Mrs. Gilbraith in their work with the bricklayers, have pointed out that in these days of "intensive business" it is necessary to measure small economies accurately and scientifically in order to produce efficiency. It will avail little to the housekeeper to have a problem solved scientifically if its cost in time or in money is prohibitive. Let me cite an example: The time honored coal range, which has been the first essential in so many households, is probably doomed to banishment as soon as a more efficient and economical method can be devised. The fireless cooker is but a step in that direction, but it is not inconceivable that central kitchens or bakeries may do the heavy part of the cooking more cheaply than it can be done in the home. This would mean that those methods of cooking which are now considered accessory might be so well developed that they would become sufficient to cover all needs.

In the hope of proving such an accessory method practical, some experimental work has been done with the electric range. In the intermountain west where mountain streams are numerous and their power is easily converted into electricity it would seem practical to cook by electricity. The housekeeper needs information not only in regard to the first cost of the equipment, but also in regard to the cost of running it. At present there seems to be but one electric range on the market which is at all practicable for household use, and this has all the objectionable features of the first gas stoves manufac-

tured, such as the low, back-breaking oven. This electric range with its oven, four discs, broiler, and utensils costs $110.00 plus the freight. That there is economy in using the utensils which fit the discs may be seen from the fact that it costs 0.25 cent more to boil one quart of water in an ordinary aluminum teakettle than in a teakettle made to fit the disc closely.

The cost of running the range is enlightening. In the intermountain west the average cost of electricity for cooking purposes is 5 cents per kilowatt hour. Using this as a basis the following figures were obtained: To boil 1 quart cold water in a cold teakettle required 12 minutes' time and cost 0.75 cent; to bake a layer cake required 45 minutes (including the time required to heat the oven for baking), and cost 3.5 cents. To bake four loaves of bread required 1 hour 18 minutes and cost 7 cents. To cook a dinner for six consisting of cream soup, roast beef, roast potatoes, asparagus, white sauce, cottage pudding with hot sauce and coffee, required three hours and cost 33.5 cents; to heat the water for washing the dishes cost 5 cents more.

In comparing the cost of baking one loaf of bread with coal and gas, we find for coal 0.21 cents, for gas 0.25 cents and for electricity 1.75 cents. Therefore, cooking with electricity is as yet an expensive method of cooking and much slower. On the other hand, it does satisfactory work, it is cleaner than gas or coal and always ready, so that the optimistic housekeeper may hope that the electrical companies will develop the range to make it more efficient.

Other problems, such as high altitude cookery, which seems to be a question of density of gases so far as investigated, or the question of using Utah flour for bread and the difficulties with different yeasts, or the effect of the pasteurization of milk upon the organic compounds, could be worked out for the housekeeper by the Home Economics worker if she had the time and means for such work.

As a means to this end, Senator Smoot of Utah introduced a bill into Congress in March, 1910, which was in due course read twice and referred to the Committee on Agriculture and Forestry. This was a bill to provide for an increased annual appropriation for agricultural experiment stations, to be used in researches in Home Economics and for regulating the expenditure thereof. A portion of the bill reads as follows: "Be it enacted that there shall be and hereby is, annually appropriated out of any money in the treasury not otherwise appropriated, to be paid as hereinafter provided, to each State and Territory for the more complete endowment and maintenance of agricul-

tural experiment stations now established, or which may hereafter be established, the sum of ten thousand dollars, to be applied only to paying the necessary expenses of conducting original or confirmatory researches or experiments bearing directly on Home Economics, including both domestic science and domestic arts, and printing and disseminating the results of said researches or experiments, having due regard for the varying conditions and needs of the respective States and Territories. That bulletins shall be published as the experiment stations will publish them, etc."

As yet the bill has not been reported from the committee. It was reintroduced last spring and is still pending.

With our college girls as future housekeepers versed in science and its application, with well trained Home Economics workers devoting their whole time to research work, and with the experiment stations provided with sufficient means, the application of science to the housekeeper's daily problem would be assured.

AN EARLY EXPERIMENT IN THE INTRODUCTION OF MANUAL TRAINING INTO THE COLLEGE CURRICULUM.

C. F. LANGWORTHY.

The records of Middlebury College show that Dr. Joshua Bates, who was president of the institution from 1817 to 1839, was interested in manual training and believed that it could be a part of college work.

The college was established in 1800 and at the time Dr. Bates became its president was passing through a period of financial depression. When Dr. Bates took up his duties as president there was much to discourage him, for the college was suffering from a lack of funds and from numerous changes in its faculty. Under his able direction the college entered upon a period of prosperity.

The records show that in 1829 a mechanical association was formed and that for a short time manual training was introduced into the college curriculum. For this work a shop was furnished and tools were supplied. About this time particular attention seems to have been given to scientific work, for chemical apparatus was imported from London, and a collection of minerals was made for use in college work. Apparently, the manual training course did not progress very satisfactorily, for in 1833 Dr. Bates attempted to raise a $50,000 fund, principally for the erection of a new college building, but in part for the establishment of an efficient manual training department. The college building was erected but nothing definite seems to have come of the plan for manual training in the college, and the project was eventually lost sight of. These facts are briefly summarized in a publication issued in 1900, at the time the college celebrated the one hundredth anniversary of its founding.

It would be interesting to know what led Dr. Bates to conclude that a manual training department was a desirable part of the curriculum of a classical college and whether the idea was in accord with any general feeling at the time or whether it was a conclusion which represented only his personal views. The examination of old college publications and similar data would doubtless throw light on the subject, which is not without interest in considering the development of education in the United States.

STUDIES OF METHODS IN FOOD PREPARATION: PASTRY.[1]

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University of Chicago.

If the preparation of food is to claim a place as an applied science, it seems necessary that the ordinary processes of cooking be reduced to a more exact basis than now prevails. With this object in view, we have been working with our advanced classes at the University of Chicago along several lines of investigation.

The first difficulty with which we were confronted was the lack of a definite standard of measure. Like others, our laboratory is equipped with glass measuring cups divided into thirds and quarters. But the capacities of these cups were found to vary anywhere from 225 cc. to 250 cc., so that it is not surprising that a cup of sugar might be found to weigh from 195 grams to 215 grams. A granite measuring cup was found on the market which is much more exact, as it is also more expensive. Even with accurate measures, however, it is difficult to fill the cups each time so that the weight of a given volume shall be the same. The number of times the flour has been sifted or the manner of filling the cup will cause a variation in weight.

From time to time a number of students have worked on the problem of standardizing measures and as a result of the large number of determinations the following averages have been adopted as tentative standards. A standard measuring cup should contain one-fourth of a quart (950 cc.) of water or 237.5 grams. On this basis a cup of milk weighs 247 grams, butter 216 grams, sugar 195 grams, pastry flour 100 grams, and bread flour 113 grams.

While we have used these weights satisfactorily in our studies of methods during the past two years, we recognize the desirability of the establishment of official, uniform standards through the agency of such

[1] Presented at the St. Louis Meeting of the American Home Economics Association, December 30, 1910.

an organization as this association. Weighed amounts must be used when experimental work is done, but these amounts to be of practical use, at present, must be translated into measures. We hope therefore that this association will assume the responsibility of determining the necessary standards. Eventually it may be desirable to express recipes in weights to the exclusion of measures, but that day is probably distant. It is interesting to note that after becoming accustomed to weighing materials to be used, some of the students are not content to use measured amounts even in practical work.

One of the cooking processes, which has been studied in considerable detail by several students, is that of pastry making. Because of the limited number of ingredients used, and the comparative simplicity of the process, this subject lends itself especially well to investigation. The aim of the study has been to discover the influence of various factors on the cost and quality of pastry.

Materials.

The materials selected for testing in this study were as follows:

Flour: (1) Bread flour, a well known commercial brand; (2) pastry flour (ordinary) of 4 different brands; (3) pastry flour (fancy); and (4) bread flour mixed with various proportions of cornstarch.

Fat: (1) Lard; (2) butter; (3) a commercial lard substitute; (4) butter and lard; and (5) butter and the commercial lard substitute in several proportions.

Method.

The usual method of making plain paste was used in most cases. According to the preference of the individual, the fat was mixed either with a knife or with the tips of the fingers. Except in a few cases, all of the fat was added to the flour at the beginning—not added by rolling into the paste. The crusts were baked at a temperature of 240° C.

Proportions.

(*A*) *Fat.*—The proportion of ingredients necessary to make crusts of equal tenderness varies with both the kind of fat and the kind of flour used. In every case more fat is required with the bread than with the pastry flour. Of the various fats, more butter than lard was

required and more lard than the lard substitute, while with mixtures of fats, intermediate amounts may be used. In our tests, the amounts used with one cup of bread flour varied from 62 grams of the lard substituted to 85 grams of butter; and with one cup of pastry flour from 43 grams of the lard substitute to 62 grams of butter. Roughly stated, ⅓ cup of fat for bread flour is needed, but if butter is used one tablespoonful more should be used, or if the lard substitute, one tablespoonful less. In general, one may consider that ¼ cup of fat is sufficient for pastry flour, but this should be increased by ⅔ tablespoonful for butter and may be decreased by ⅔ tablespoonful if the lard substitute is used. The proportion of fat used, then, may vary from ⅕ cup to ½ cup for bread flour and from ⅙ to ½ cup for pastry flour.

As the proportion of fat is increased, the proportion of salt needed increases also. Of the various fats, the lard substitute demands the largest proportion and butter the smallest. The usual usage is from four grams (less than one tablespoonful) for butter to six grams (1½ teaspoonful) for the lard substitute to each cup of bread flour.

(*B*) *Water.*—The amount of water used varies with the amount and kind of fat and also with the kind of flour used. In general the larger the amount of fat used, the smaller will be the amount of water required. But bread flour with ⅓ cup of fat will require as much or more water than pastry flour having only ¼ cup of fat. However, the amount of water used depends upon the individual worker. In almost every case one of our students used a larger amount of water than did another. This is due to her personal preference for the kind of crust resulting. When the smaller amount of liquid is used a certain degree of pressure with the hands is necessary to form the paste, and the crust when baked is so friable that it can with difficulty be be taken from the plate. That made with the larger amount of liquid, while still tender, is more consistent and there is less danger of breakage.

The amount of water to be added is one of the most variable factors. It is influenced not only by the kind of flour and the kind and amount of fat, but also by the temperature of the paste and the fineness of division of the fat in the flour. Such factors as these may account for variations from the normal.

The amount of water used has a decided influence upon the tenderness of the crust. In an experiment where different amounts of water were used with the same flour and same amount and kind of fat, 30

grams of water with 1 cup of pastry flour and ¼ cup of lard made a crust which was friable (or as it seemed to the student, "too rich"); 36 grams produced a crust of desirable tenderness; while 40 and 44 grams resulted in a product more or less tough.

Ingredients.

(*A*) *Flour.*—It was agreed that bread flour makes a good crust, ordinary pastry flour one which is more tender, and fine pastry flour the most tender of all. However, to some the difference in tenderness between the ordinary and fine pastry flours was not considered sufficient to compensate for the increased cost. One experiment was made in which bread flour was modified by different percentages of cornstarch. When 15 per cent of cornstarch was added, the resulting crust could not be distinguished from the fine pastry flour, and the cost was much less.

(*B*) *Fat.*—Butter gives the best flavor and the lard substitute the poorest. If butter and the lard substitute are combined in equal proportions, the flavor of the latter is fairly well covered. The lard substitute makes a crust which is very tender and friable but not so flaky as lard. Because of the softness of the fat it is more essential to keep the ingredients cold when using it.

Cost.

When the different fats are used with the several types of flour in amounts suitable to produce crusts of approximately the same quality, there are marked differences in the cost. Obviously the use of butter increases the cost most markedly. The use of the fine grade of pastry flour also raises the cost considerably. The cheapest crust is made by using the lard substitute, with ordinary pastry flour. This cost only 2.5 cents per cup. The most expensive made was by using butter with bread flour, which cost 8 cents per cup. The cost was calculated on the average retail price of materials—*e.g.*, lard, 18 cents per pound, butter 35 cents, the lard substitute 15 cents, pastry flour 5 cents per pound, bread flour 24 lbs. for 85 cents, and the fine pastry flour 44 oz. for 25 cents.

The results are summarized in the following table:

Table I. Pastry made with varying amounts of different fats to produce the same tenderness.

FLOUR.		FAT.		WATER.	SALT.	COST PER CUP.		
Kind.	Weight.	Kind.	Weight.	Weight.	Weight.	Flour.	Fat.	Total.
	Grams.		*Grams.*	*Grams.*	*Grams.*	*Cents.*	*Cents.*	*Cents.*
Bread ...	113	Lard	72	46	6	0.9	2.9	3.8
		Butter	85	50	4.5	0.9	7.1	8.0
		Lard substitute	62	26	6	0.9	2.0	2.9
		Butter + lard	79	35	5	0.9	5.1	6.0
		Butter + lard substitute	74	30	5	0.9	4.5	5.4
Pastry...	100	Lard	54	40	5	1.1	2.2	3.3
		Butter	64	48	4	1.1	5.3	6.4
		Lard substitute	43.2	20	5	1.1	1.4	2.5
		Butter + lard	59	27	4.5	1.1	3.7	4.8
		Butter + lard substitute	54	25	4.5	1.1	3.4	4.5
Fancy pastry	100	Lard	54	40	5	2.0	2.2	4.2
		Butter	64	48	4	2.0	5.3	7.2
		Lard substitute	43.2	20	5	2.0	1.4	3.4
		Butter + lard	59	27	4.5	2.0	3.7	5.7
		Butter + lard substitute	54	25	4.5	2.0	3.4	5.4

Methods of Mixing.

A little work was done on the influence of different methods of combining. The same proportions were used but part of the fat was added by rolling it in successive portions into the paste. It seemed quite clearly indicated that by this method the paste is more flakey but less tender. This is to be expected since with the smaller amount of fat used in making the first paste a larger amount of water will be used and, as already shown, increasing the amount of water increases the toughness of the crust.

Experiments were also tried in which egg-white, or baking powder, or both, were added. The conclusion in regard to the former was that it increased the cost without adequate influence upon the quality of the crust. If baking powder is used the proportion of fat can be decreased without injuring the quality of the crust. However the crust did not keep well, acquiring a quite unpleasant taste within a day or so.

Methods of Treating the Lower Crust of a Juicy Pie to Prevent its Becoming Soggy.

The following methods were studied to see their influence upon the sogginess of the under crust of a juicy pie:

(1) The crust was spread with egg white; (2) the crust was sprinkled with flour; (3) the crust was sprinkled with corn starch; (4) the pie was put on the *bottom* of a very hot oven (300° C.) for 15 minutes, then the temperature lowered to 240° C.; (5) the lower crust was baked 5 minutes and then filled; (6) pies were baked in granite plates, perforated tin, tin wire, and plain tin plates (the latter both new and old); (7) the top crust was washed with water before putting into the oven which was kept at 300° C.; (8) the pie was put for 15 minutes on the bottom of an oven at a temperature of 300° C., then removed to the upper shelf.

The following conclusions were reached:

(1) Egg white, flour and cornstarch serve to prevent sogginess to some extent.

(2) Pies baked in a granite plate are most browned on the bottom, those in an *old* tinplate are second, while the perforated and wire tins are next in order.

(3) The *best* way to bake a juicy pie is in a *granite plate*, placing it on the *bottom* of an oven at 300° C. for 15 minutes, then removing it to the upper shelf to finish baking.

While the results herein reported, owing to the limited amount of data, will only permit one to draw tentative conclusions, they do serve to give much more definite information than we have had heretofore.

This report illustrates the methods which we are using at the University of Chicago to study the ordinary cooking processes which have been so largely controlled by rule-of-thumb methods. Similar studies have been made upon the making of bread, biscuits, cake, and doughnuts; upon factors influencing the efficiency of freezing mixtures; upon the amount and kinds of ingredients desirable in gelatin desserts, etc. By these means we not only acquire very desirable information but we also train the students in methods of research and in the compilation and interpretation of data, and give them valuable training in technique. It is a frequent criticism of college courses that students are not given an opportunity to acquire technical skill. It is impossible to undertake the study of a problem of this nature of any length without considerably increasing this type of ability.

THE PRESERVATIVE ACTION OF SPICES.

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During recent years there has been a good deal of discussion and legislation on food preservatives. Sodium benzoate has been of particular interest because some experts maintain that it is not harmful to the human system when used in quantities that will prevent the growth of micro-organisms in food, whereas others ascribe injurious properties to it, and strongly condemn its use. Whatever may be the merits of this controversy, the fact remains that many people prefer not to eat food containing sodium benzoate. At this time, therefore, it is interesting to consider the preserving properties of various articles which we commonly use in our food.

It is a matter of common knowledge that fruits or vegetables prepared with the addition of spices and vinegar keep longer without being carefully sealed than do those same fruits or vegetables put up alone or with only ordinary amounts of sugar. Unsealed pickles and ketchups will keep for a long time without the growth of micro-organisms. Cakes containing spices are also known to keep longer than other cakes. Fruit cake, which always contains spices, is often made several weeks before using, since its quality is said to improve with age. Although it is known in a general way that spices have something to do with the keeping of food to which they have been added, yet they have never been used with the primary idea of exerting a preservative effect. The spices are added rather on account of the flavor which they impart, and it is only a lucky coincidence that they also help to keep the food from spoiling. When spices are used in food, several kinds are almost always added together, and usually the cooking is done in a liquid which contains more or less vinegar. It is common to add to pickles and ketchups, especially, as many as six or eight kinds of spices. Just which of the spices have any value in preserving the food, is not generally known.

All condiments are irritating to the mucous membrane, and are injurious when used in excessive amounts. Their use, then, must be limited. Hence every housewife should know just which of the condiments she adds in her cooking will help to preserve the food, and which of them are of no value except for their flavor, so that she can regulate her use of them accordingly. As it will be seen in the tables below, some of the most irritating spices have no value whatever as preservatives.

Vinegar in sufficiently high concentration prevents the growth of micro-organisms, and must be considered an important preservative. In a single test made by us, 100 cc. of vinegar was added to 100 grams of apple sauce. The mixture was boiled over a flame until the volume was again reduced to 100 cc., when it was exposed to the air for a few days and then stoppered to prevent evaporation. The sauce has not spoiled after $4\frac{1}{2}$ months. In much less concentration the vinegar would no doubt retard growth.

A few experiments were carried out under conditions that would pertain in any kitchen to compare the preserving properties of various spices, and to determine the amounts of them which will prevent all growth of micro-organisms. Apple sauce to which a small amount of sugar had been added was used in all of the tests except those on ginger, black pepper, and cayenne pepper recorded in Table I where cabbage was used. In every case the given amount of spice was mixed with 100 grams of the cooked material in small Erlenmeyer flasks. After adding the spice the flasks were placed in the steam sterilizer and steamed for thirty minutes. When removed from the sterilizer they were left open in the laboratory for a few days to receive contamination from the air and then closed with cork stoppers to prevent evaporation. The figures in the tables show the number of days after being put up when growth was first observed in the flasks. It was assumed that the growth of yeasts, molds, or bacteria would change the appearance or odor of the sauce, and no further tests for growth were made. In every case it was the molds which first made their appearance. The flasks were not examined between the sixtieth and one-hundredth days, so that the exact time of the spoilage of the apple sauce containing allspice in three of the flasks is not known. The tests recorded in Table I were preliminary, and the results served to suggest the amounts of spices to be used in later experiments.

Table I.—Time of spoilage of food containing varying amounts of spices.

AMOUNT OF SPICE.	CONTROL.	NUTMEG.	CINNAMON.	ALLSPICE.	CLOVES.	GINGER.	BLACK PEPPER.	CAYENNE PEPPER.	MUSTARD.
Grams.	*Days.*	*Days.*		*Days.*		*Days.*	*Days.*	*Days.*	
0	4								
2.5		5	No spoilage in 14 months.	16	No spoilage in 14 months.	5	4	4	No spoilage in 14 months
5		6		60–100		5	4	4	
7.5		7				5	4	4	
10		16				5	4	4	
15		27		195		5	4	4	

From Table I it appears that ginger, black pepper, and cayenne pepper do not prevent the growth of micro-organisms, but that cinnamon, cloves, and mustard are valuable preservatives and that nutmeg and allspice delay growth.

Further experiments were carried out to determine more accurately the amounts that will prevent growth. Flasks were again put up with ginger, black pepper, and cayenne pepper in large amounts. The results are given in Table II, as follows:

Table II.—Time of spoilage of apple sauce containing varying amounts of spices.

AMOUNT OF SPICE.	CONTROL.	GINGER.	BLACK PEPPER.	CAYENNE PEPPER.
Grams.	*Days.*	*Days.*	*Days.*	*Days.*
0	4			
15		6		7
20		8	6	7
30		7	6	6

Even where the large amounts of 30 grams of spice to 100 grams of apple sauce were used growth took place only two or three days later than in the control flask. Bitting[1] reports that molds will grow in a few days on a paste made of these ground spices mixed with water. It is obvious, then, that ginger, black pepper, and cayenne pepper can be of no value as preservatives in the small proportions in which they are used in cooking.

The effect of cinnamon, cloves, mustard, allspice, and nutmeg in small amounts was tested in another experiment. The results are given in Table III:

[1] U. S. Dept. Agriculture, Bureau Chemistry Bull. 119. Experiments on the Spoilage of Tomato Ketchup.

Table III.—Time of spoilage of apple sauce preserved with spices.

AMOUNT OF SPICE.	CONTROL.	CINNAMON.	CLOVES.	MUSTARD.	ALLSPICE.	NUTMEG.
Grams.	*Days.*	*Days.*	*Days.*	*Days.*	*Days.*	*Days.*
0	9					
0.25		9	15			
0.5		30	15	115	9	
1		84	74	60	9	9
1.5		84	Not spoiled in 8 months			
2		Not spoiled in 8 months			9	
2.5				Not spoiled in 8 months	16	9
5					9	9
7.5						9
10						10

Allspice in the proportion of 5 grams of spice to 100 grams of sauce did not have even a retarding effect, although the flask containing 2.5 grams kept sixteen days, whereas the control flask kept nine days. Nutmeg in the proportion of 10 grams to 100 grams of sauce delayed growth only one day. Hence these spices also cannot be considered of practical value as antiseptics.

Cinnamon, cloves, and mustard are about equal in their efficiency. The flask containing 0.5 gram of mustard kept for almost four months; the flask containing 1 gram kept two months; and the flasks containing 2, 2.5, and 5 grams were still keeping, eight months after having been put up. The flask containing 0.5 gram of cinnamon kept one month; the flasks containing 1 and 1.5 grams kept almost three months, and the flask containing 2 grams is still keeping. Cloves in the proportion of 0.25 gram to 100 grams of sauce delayed growth for several days; the flask containing 1 gram kept for $2\frac{1}{2}$ months; and the flasks containing 1.5 and 2 grams are still keeping.

The three spices cinnamon, mustard, and cloves, must then be considered important preservatives. Cinnamon and mustard are particularly valuable, for they are palatable even when used in proportions that prevent all growth. Cloves in the proportion which prevented growth (1.5 grams to 100 grams of sauce) had too much of a burning taste to be palatable. However, they retard growth in much smaller amounts.

The active antiseptic constituents of mustard, cinnamon, and cloves

are their aromatic or *essential* oils, as they are termed. Clove buds yield about 15 per cent of essential oils, of which the greatest part is eugenol, or oil of cloves. Cinnamon bark yields from 0.5 to 1 per cent of essential oils. About 70 per cent of this is cinnamic aldehyde, which gives to cinnamon its characteristic odor. The essential oil of cinnamon also contains from 4 to 8 per cent of eugenol and some other aromatic compounds in smaller amounts.

The much smaller yield of the essential oil from cinnamon bark as compared with that from clove buds is compensated by its much greater antiseptic properties, which are brought out in Table IV. These tests also were made with apple sauce.

Table IV.—Time of spoilage of apple sauce preserved with essential oils.

AMOUNT OF OIL.	CONTROL.	CINNAMIC ALDEHYDE.	EUGENOL.
Grams.	*Days.*	*Days.*	*Days.*
Test A.			
0.026	3	80	6
0.052		120	12
0.105		Not spoiled in 14 months	Not spoiled in 14 months
0.157			
0.21			
Test B.			
0.0	9	60	
0.013			9
0.026		Not spoiled in 8 months	13
0.052			9
0.105			Not spoiled in 8 months

Cinnamic aldehyde even in the smallest proportion used—a little over 0.01 gram to 100 grams of sauce—delayed growth to sixty days, and in double this amount prevented growth entirely in the second set of flasks. As in the case of the cinnamon from which it is derived, cinnamic aldehyde is palatable in proportions which will preserve food.

It required considerably higher proportions of eugenol for complete preservation. In both tests 0.105 gram of eugenol to 100 grams of sauce prevented all growth. This amount gives too much of a burning taste to be palatable, which is in agreement with the results obtained with cloves. One-half of this amount delayed growth somewhat, and did not give too strong a flavor. The essential oils of both cinnamon and cloves, however, lack much of the good flavor of the spices.

In continuation of the above work, it was thought advisable, in view of the present controversy relative to the manufacture of ketchups and the use of preservatives therein, to examine various ketchups as to the types of organisms present. Spices are extensively used in the manufacture of ketchup and in many commercial brands sodium benzoate is employed as a preservative. The use of sugar also has been adopted as aiding the keeping qualities of ketchups.

Accordingly any organisms which could grow in such a medium would be more or less of a resistant type and a critical and crucial test of the preservative action of various substances could be made upon them. In previous work these substances had been added to the medium and the latter then exposed to natural contamination. The work reported below was performed on pure cultures of organisms isolated from ketchups which were undergoing spoilage, the method adopted for this work being analogous to that employed in testing the strengths of disinfectants.

On examining various ketchups, the predominant type of organism usually found proved to be yeasts, presumably several of the wild species. These undoubtedly find a favorable medium in ketchup, particularly that containing sugar, which they ferment with evolution of carbon dioxide, this resulting in the characteristic gassy fermentation of many of the spoiled ketchups. Of the bottles examined several were so charged with carbon dioxide that on opening, the contents were blown out of the bottle in all directions with explosive force. Besides yeasts several organisms of the bacillar type were isolated, and in several bottles of ketchup which had been bottled cold an organism identical in most respects to the ordinary lactic acid bacterium was found. A large spore-forming bacillus was isolated from one of the heated ketchups. The predominant flora throughout, however, proved to be yeasts.

After preliminary isolation of these various organisms on an acidified tomato-broth agar, replating and re-isolation were performed to insure purity of the cultures. No attempt was made to identify these various organisms by detailed study. They were employed directly to test out the preservative action of cinnamic aldehyde, eugenol, and benzoic acid, respectively. Numerous difficulties were here encountered before a suitable medium and a satisfactory method were devised. The medium finally adopted was a tomato broth bouillon containing 1 per cent sugar and adjusted to 1.5 per cent normal acid. But even with this medium, which gave good growth, it was difficult

to test out the action of the various substances above mentioned, owing to the fact that their addition even in minute quantities occasioned a more or less pronounced turbidity which was with difficulty differentiated from that produced by bacterial growth. In several cases it was necessary to make microscopical examinations in order to ascertain whether or not growth had occurred.

Suspensions of the respective organisms were prepared by inoculating tubes of the tomato bouillon and incubating until turbidity had occurred, which usually required forty-eight hours. After thorough shaking one loopful of these cultures was transferred to tubes containing 5 cc. of sterile broth. To these were then added varying amounts of cinnamic aldehyde, eugenol, and benzoic acid, respectively, equivalent to 1, 2, 5, and 10 parts per 10,000 parts of inoculated bouillon. Two tubes of each organism with each of the varying amounts of the different preservatives were prepared. All tubes were incubated at 37° C. and examined daily for three days. The results secured are recorded in Table V.

Table V.—Influence of preservatives indicated upon growth of certain organisms.

Organism employed.	Cinnamic aldehyde.					Eugenol.					Benzoic acid.				
	5:100,000.	1:10,000.	2:10,000.	5:10,000.	10:10,000.	5:100,000.	1:10,000.	2:10,000.	5:10,000.	10:10,000.	1:10,000.	2:10,000.	5:10,000.	10:10,000.	20:10,000.
23d spore-formers		+	−	−	−		+	±	−	−	+	+	+	−	
		+	−	−	−		+	+	−	−	+	+	+	±	
		+	±	−	−		+	+	±	−	+	+	+	+	
5X yeast		−	−	−	−		−	−	−	−	+	−	−	−	
		−	−	−	−		−	−	−	−	+	−	−	−	
		−	−	−	−		−	−	−	+	−	−	−	−	
23y bacillus (spore-former)	+	±	−	±		+	+	+	−					−	−
23d bacillus (spore-former)	+	+	±	±		+	+	+	+					+	+
23e blunt bacillus	+	+	−	−		+	+	+	−					+	±
5n yeast	+	±	−	−		+	+	+	+					+	+
27a yeast	+	+	+	+		+	+	+	−					+	+
5b yeast	+	±	−	−		+	+	+	±					+	+
5d yeast	+	±	−	−		+	+	+	−					+	±
23g bacillus in chains	+	+	+	+		+	+	+	+					+	+

From the data submitted it is at once apparent that cinnamic aldehyde possesses a more marked antiseptic action than either eugenol

or benzoic acid. Of the two latter, benzoic acid appears to be by far the least effective as a preservative. In case of cinnamic aldehyde a concentration of 2 parts per 10,000 was sufficient to inhibit the growth of most organisms, only 3 out of the nine employed showing growth at this concentration. With eugenol 5 parts per 10,000 proved insufficient to prevent the growth of all the organisms tried, five out of nine having grown. Benzoic acid on the other hand revealed a much weaker antiseptic action than either of the above, eight forms out of nine growing in a concentration equivalent to 10 parts per 10,000, and five out of nine in a concentration of 20 parts per 10,000, while three others showed doubtful evidence of growth.

In view of the fact that this work on pure cultures was performed by one of the authors, whereas the work on the apple sauce was performed independently by the other, it is interesting to note that the results in both cases coincide remarkably. For direct contamination of the specially prepared apple sauce, it was found that 0.01 gram of cinnamic aldehyde per 100 grams of sauce (equivalent to 1 part per 10,000) was sufficient to delay growth at least 60 days and that 2 parts per 10,000 prevented all growth, results with which the data in Table V correspond very closely. With eugenol the same remarkable correspondence maintains, the results of both observers showing that 10 parts per 10,000 were sufficient to inhibit growth. Thus, both methods, the more practical household method of direct exposure to contamination and the laboratory pure-culture method, yielded results identical in all respects.

In view of the above, it appears that cinnamic aldehyde and eugenol as such possess considerable preservative action and aid materially in preserving substances to which they are added. As both are contained in such spices as cinnamon and cloves, no doubt the marked preservative action of these spices, as shown in the above experiments must be attributed to their content of these essential oils. As this preservative action takes place, even when the spices are used in the small quantities necessary for flavoring, may not their use be recommended in contrast to such spices as pepper and ginger, which have been shown to possess but little, if any, preservative action? The possibility of the more liberal use of cinnamon and cloves in the preparation of ketchup is also of interest because of its bearing on the use of preservatives in such materials, concerning which there has been so much discussion.

STRENGTH OF FLOURS.[1]

FRANCES FREEMAN.

Strength according to Humphries and Biffen is "the capacity for making large well-piled loaves," meaning by this, size and shape. T. B. Wood also gives the primary factor as size of the loaf, the other factors being shape, and perhaps to a slight extent texture. The old idea was that strength was due to gluten which because of its tenacity held in the bread the carbon dioxide evolved by the yeast. Some investigators suggest that strength depends upon the ratio of gliadin to glutenin. However, Wood concludes that neither percentage of total nitrogen nor of gliadin in the flour, nor the ratio of gliadin to glutenin can be taken as an absolute measure indicating strength in flour.

Wood's theory is that the largeness of the loaf depends chiefly upon the power of flour to give off gas fermented withyeast, and the suggestion is made that shapeliness and probably gas retention are dependent upon the physical properties of the gluten as modified by the presence of the varying proportions of salts. The properties of gluten which vary with concentration of acid and salt are coherence, elasticity, and water content, and it is suggested that these properties have an important bearing on the shape of the loaf.

Snyder concludes that to produce bread of the best properties, and to have a well-balanced gluten capable of expansion, it must be composed of approximately 65 per cent of gliadin and 35 per cent of glutenin.

With these two theories as a basis for work, determinations in eight samples were made of total nitrogen, water- and salt-soluble nitrogen, glutenin, and gliadin, according to the methods used by Snyder. The soluble carbohydrates dextrose and sucrose were determined by use of Allihn's modification of Fehling's solution. Carbon dioxide was estimated by collecting the gas evolved by the flour fermented by

[1] This paper and the one following represent joint graduate work at the Ohio State University. They were presented at the St. Louis Meeting, December, 1810, of the American Home Economics Association.

yeast for a period of 16 hours. Total acidity was found by titration with tenth-normal sodium hydroxid.

The soluble salts were determined by measuring their electrical resistance in ohms, the post-office box form of Wheatstone bridge, Kohlrausch cell, being used.

With the exception of one flour the proportion of glutenin to gliadin was 43:56. Although this does not agree with Snyder's proportion for good flour, excellent bread of good shape and size was made from some of the samples, but poor bread of good shape and small size was obtained from others. Durum flour—with the proportion of gluten to gliadin 36:63—made the smallest loaf, though it agreed almost exactly with Snyder's proportion. This flour also contained the highest percentage of soluble carbohydrates and gave a high carbon dioxide evolution. Since it made the smallest loaf, this also does not bear out Wood's theory.

No definite agreement was found between the size of the loaf, the carbon dioxide involved, and the total soluble carbohydrates. The only comparison observed was that the two flours giving the smallest loaves and best shape contained also the smallest amounts of water-soluble nitrogen, which may be only a coincidence. No relation could be seen between the total acidity and soluble salts and the shape and size of the loaf.

The size may depend upon some property of the gluten for retaining the gas evolved.

EXPERIMENTAL WORK WITH WINTER AND SPRING WHEAT FLOURS.

IDA SHILLING.

The value of flour to the baker, according to Wood, depends upon at least four distinct properties: (a) The volume of the loaf given quantity will produce, which may vary more than 30 per cent; (b) the amount of water which a given quantity will absorb in making a dough of the proper consistency for baking, which may vary from one-half to three quarters of its own weight; (c) the shape of the loaf; and (d) the texture and color of the bread.

Some studies of the relative qualities of different sorts of flour have been made recently at the Ohio State University as a part of graduate work, and are here briefly reported. The samples of spring wheat

flour used included two commercial brands (A) and (B) and a second grade durum. The winter wheat flours included five commercial brands, designated as (C), (D), (E), (F) and (G).

The simplest possible recipe and the quick-process method were used. For scoring the flour 425 gms. were taken as a standard. The remaining ingredients weighed as follows: 5.5 grams salt; 12.5 grams lard; and 12.5 grams sugar. The yeast was soaked in a measured amount of water and 35 cc. of this mixture, the equivalent of one cake, was used for each loaf.

The amount of water used for each flour was determined by the baker's sponge test. This also gave the theoretical volume.

Each loaf was made separately. Weighed amounts of salt, sugar, and lard were placed in mixing bowls. The determined amount of boiling water, minus 35 cc., was then added. This mixture was allowed to cool until luke-warm when the yeast was put in. The flour was thoroughly worked in by means of a spatula, special care being taken not to lose any. It was then kneaded in the bowl for ten minutes, and was allowed to rise until it doubled in volume, when it was placed in a greased pan without kneading and again allowed to rise until the volume doubled.

By experiment it was found that a second kneading had no effect on size and shape. The temperatures worked out were 240° C. the first 15 minutes; 220° C. the second 15 minutes; and 200° C. the third 15 minutes.

The volume was determined by displacement in sugar. Each loaf was first weighed and then measured. The bread was also judged as to shape, color, texture, and flavor.

Only one sample (durum) gave Snyder's ratio (36:63). This also contained 8.6 per cent of soluble carbohydrates, more than any other sample. It made the smallest loaf, but had a most excellent shape. Therefore in this case, neither Wood's nor Snyder's theories hold good.

Commercial brands (A), (E), and (B) each made large loaves of good shape, with a proportion of glutenin to gliadin of 42:58. Brand (C) made a large loaf but lop-sided in shape, the proportion here also being 42:58. The others had the same proportion, good shape, and large loaves.

It was found that excellent bread of good shape and good size could be made from some of the samples, and that poor bread of good shape and small size obtained from others.

This year it was suggested that perhaps the amount of yeast used for a loaf of bread influenced the size and shape of the loaf, but experiments seem to show that neither a small nor a large amount of yeast had any effect on the size and shape.

A series of experiments has been started to show the effect of the absence of salt, or sugar, or both, on size and shape. No conclusions can as yet be drawn. All these experiments must be tried, using all the other samples also.

It is suggested that for other work there be made an analysis of samples to determine the kind of salt or acid present and their effect on the proteid of the flour. The proportion of salts to total proteid should also be determined.

A COÖPERATIVE KITCHEN.

BLANCHE MCNERNEY.

In Carthage, Missouri, there was an energetic woman; there was the approaching heat of summer; and there was the anticipation of many pleasures cut short by the ever-present problem of keeping peace in the family by having meals on time. The energetic woman suggested to her friends of the neighborhood that they try an experiment. She proposed the "coöperative kitchen" as an agreeable and easy way of solving the food and servant question for the summer months.

The plan evolved and tried with success was as follows: A vacant house in the neighborhood was rented for four months, and a woman of ability found who would act as general manager and overseer of the servants. The house was a large, cheerful, old fashioned, colonial house with a huge yard filled with large oak shade trees, and with a very attractive veranda on two sides. The attractiveness of this spot increased the pleasure of those who might arrive before the meals, or of any who wished to remain afterward.

The whole first floor was given over to the dining room and kitchen. The second floor furnished quarters for the manager and her family, while the third floor was devoted to servant's quarters. Later, when it was made sure that the plan was to succeed, and the "kitchen" was to continue through the winter months, the extra rooms were rented to school teachers. This, of course, was a great accommodation to the teachers and a great help to the prosperity of the "kitchen."

The original plan had been to include only the families within a radius of a block, but as time passed and the success of the scheme was assured, some bachelors and teachers applied for places. Although the house was located some blocks from the business section, it was very convenient to the car-line.

Each family having membership in this "kitchen" was to furnish its own table, table linen, silver, and any delicacies, such as preserves, jellies, etc., which give the meal an individual and homelike character. The rooms were large and the distance between the tables was sufficient to insure privacy of conversation if the voices were kept com-

paratively low. The bachelor's table was fitted out by the manager —the men gladly paying for the necessary equipment.

It is not so difficult a matter to keep servants in such an establishment as in a private home, since the wages are good, there are several servants, and no chance for lonesomeness, and, although the hours may be long, every servant has two hours a day off duty, and a half day every other week. There are two cooks, a head cook and her assistant, a dishwasher, and the waitresses who belong to the regular corps of the "kitchen." On alternate Sunday afternoons the waitresses are given a vacation and the children are allowed to assist the manager in serving the lunch for that evening.

The manager is a woman of much ability who understands the scientific value of food. She prepares the menu, purchases the groceries, buying them in large quantities which of course lessens the price, and with the assistance of a board, composed of members of the "kitchen," attends to the financial problems of the establishment.

The scheme of these Carthagenians is, perhaps, not entirely practical for those families with small children, unless the baby can be left with the nurse while the mother is gone. The nurse under such circumstances may take her meal later.

The "kitchen" has now been in working order for two years. The summer months are by far the most prosperous. Of late, the membership has been decreasing, due, perhaps, to the home instinct which prevails in most men. A business man usually prefers the quiet seclusion of the family dining room, and the more delicate dishes prepared to please him, to the large room with many tables and the comparatively unappetizing dishes prepared in large quantities. The first evil could be done away with by renting a whole dining-room, but the people who have this "kitchen" in charge are of moderate means and one object in the plan was to lessen expense. In such a place as the "kitchen," however, the greatest amount of skill and the most careful supervision will not suffice to keep down the gradual tendency toward the *regular boarding-house* style.

The financial side of the problem has worked out in a manner entirely satisfactory to all concerned. Each adult member pays $3.50 a week, and a half price rate is given to children between two and seven years of age, and to family servants who do not require service. The following table of incomes and expenses for January, 1910, will furnish a very good idea of the finances. This month was an exceedingly trying one and expenses and incomes barely balance.

**Income and Expenses, January.*

Income.		Outgo.	
Membership dues	$700.00	Servants	$134.00
Rent for two rooms	15.00	Manager's salary	35.00
Guests at $0.25 per meal	80.00	Rent	40.00
		Light, heat, ice	38.00
		Two telephones	3.50
		Meat	163.00
		Milk and cream	64.00
		Groceries	307.50
		Incidentals	5.75
		Cash on hand, February 1	4.25
	$795.00		$795.00

*I am indebted to an article by Mrs. Blair in the *World's Work*.

A QUIET FACTORY LUNCH ROOM.

ETHEL R. PEYSER.

Associate Editor of "Good Housekeeping."

It will be gratifying to many to know that in New York City a lunch room has been recently opened, devoted to the *quiet* and comfort of the employes of the factory with which it is connected.

The Electrical Testing Laboratories on Eightieth Street and East End Avenue have given a large hall for dining room purposes. The management of this hall is under the direction of Mrs. Root, a New York woman who is devoting herself to the administration of factory lunch rooms on a scientific and practical basis. This room is about 80 feet long by 14 feet wide, and is divided in the middle by an improvised wooden kitchen about 10 by 26 feet, with serving windows at each end (so that both halves of the dining room may be served simultaneously). It has a door leading into the passage-way which is on one side of the room and which permits of egress at either end. The women employes are seated in that part of the room nearest the exit and the men are placed at the further side beyond the kitchen, the men and not the girls having to take the longer walk. This is but one of the many evidences of the thoughtful management which has assured the success of this undertaking.

There are two rows of eight tables in each division of the room, with chairs for five persons each, one end of each table being drawn close to the wall. The tables are rectangular, of polished golden oak,

and are furnished with plated silver, glassware of good quality, bottles of tomato catchup, Worcestershire sauce, bread, butter, a water bottle, and paper napkins.

The employes have 30 minutes for lunch and are served in two 30-minute relays. Generally 80 people and sometimes more use the room, so that 40 people, 20 in each part of the hall, are waited upon at the same time and served noiselessly and with clockwork precision with the regular dinner in less than 15 minutes by but two waitresses, while Mrs. Root and her assistant remain in the kitchen. The question naturally arises: How can this work be done so *quietly* and so *quickly?* How are noise and confusion eliminated? The answer is this: There is no long bothersome menu hanging on a remote wall to be studied by a crowd of hungry workers. Each employe has a regular seat assigned to which he unhurriedly goes. One plate containing the roast and vegetable is promptly placed before each one and a choice is given of beverage and dessert. This arrangement necessitates but two trips for the waitress who does her work noiselessly and rapidly on rubber heels. What is looked upon in this room as the greatest of faults is the clattering of dishes and this always provokes the condemnation of Mrs. Root.

It is, therefore, very nearly like a home dining-room except that there is a choice of three desserts (stewed prunes always being the available third choice). And it is furthermore like a home meal because any one can have a dairy lunch consisting of a bowl of milk with bread and butter, instead of the roast and vegetable. The restful quiet can not be overestimated and is as much appreciated as is the daily menu and its careful preparation. The director does all the cooking with the assistance of one helper, and the men are especially appreciative of the excellent pies, cakes, and bread. Below is a week's menu which is quite typical, except that soup is added in the winter.

Monday.—Bread, butter, roast beef, baked potatoes; blackberry or custard pie, or prunes; tea, coffee, milk, or cocoa.

Tuesday.—Bread, butter, meat stew; boiled rice, fruit jelly, bananas, or prunes; tea, coffee, milk, or cocoa.

Wednesday.—Bread, butter, roast lamb, baked potatoes; strawberries, bananas, or prunes; tea, coffee, milk, or cocoa.

Thursday.—Bread, butter, roast veal (with dressing) boiled potatoes in jackets; chocolate pudding with cream, preserved peaches, or prunes; tea, coffee, milk, or cocoa.

Friday.—Bread, butter, fried cod, baked potatoes; ice cream, preserves, or stewed prunes; tea, coffee, milk, or cocoa.

No meal is served on Saturday as the factory closes at noon.

This tabulation speaks for itself. In regard to dietary values and general attractiveness a nice balance is maintained and meets with the approval of all.

Chicken and turkey are sometimes served when market conditions permit.

The kitchen is very small but it has the advantage of saving unnecessary steps. It is managed according to thorough scientific, economic, and hygienic methods. Towels and dishes, in fact all utensils, are sterilized, dust traps are much in evidence, and the latest labor-saving devices (electric ice cream freezers, etc.) are employed.

At the last Lake Placid Conference of the American Home Economics Association, Mrs. Dewey said, "Food served 10 minutes from the fire to the table is often spoiled. To come promptly to meals at a fixed hour not only insures food at its best but also preserves family life. To have perfect food one must eat in the kitchen." The first condition stated by Mrs. Dewey, that of "promptness," is fulfilled in this factory by calling the employes by a system of telephone signals.

The second condition, that of perfect or hot food, is fulfilled by the location of the kitchen in the very centre of the dining room.

The following notice is very indicative of the courtesy and the regard shown throughout the factory and lunch room, the authorities actually assuming the rôle of the "gracious host."

NOTICE.

Because of the poor and inadequate lunch facilities available in this neighborhood, which results in a great deal of time being wasted, the Company has arranged to serve a simple plain lunch to all its regular, permanent employes.

On and after January 13, 1910, lunch will be served in the rooms provided for the purpose, on the southern side of the building. In a general way lunch will be served in the two departments separately as follows:

Photometrical Department and Mechanical Force...12.30 to 1.00 p.m.
General Testing Department and Office.....12.45 to 1.15 p.m.

The lunch period will therefore be strictly one-half hour long, and the hours for all employes will be as follows:

8.57 a.m. to 12.30 or 12.45 p.m.
1.00 or 1.15 p.m. to 5 p.m.

Employes who prefer to obtain their lunch elsewhere are of course at liberty to do so, but only 30 minutes will be allowed for that purpose.

Each employe will have a seat assigned to himself or herself. It is requested that each person always use the same seat.

It is hoped that all employes will appreciate the fact that they will virtually be *guests* of the Company and that the social proprieties usually observed under such circumstances will not be forgotten.

When the lunch room was first started in this building the meals were given absolutely free of charge to all regular employes. The director received 25 cents per capita per diem, and was (and is now) guaranteed 70 "guests." In June, 1911, when Mrs. Root's administration was just gaining permanence, she was cut down to 20 cents per capita per diem, as the company found that their expense was too great. At the same time each employe was requested to pay 50 cents a week (equivalent to 10 cents daily), the factory still assuming the larger outlay.

Naturally when a thing is given away the recipients are little prone to be dissatisfied, and while this condition existed every thing went well, but when the change was instituted involving the taxing of the employes and the diminishing of the director's allowance it was not a little disconcerting. However, and this certainly speaks more strongly than words for the quality and kind of food and service, the satisfaction has been just as great and there has been an increase rather than a decrease in the patronage of the dining-room. In fact the officers and manager of the factory are among the well-pleased patrons.

Mrs. Root is particularly skillful in the way she prepares food, and her knowledge, not only of dietetics but of the needs of the tired worker, has caused her to be looked upon by employer and employed as a real God-send.

Would that this sort of work might be done in *all* factories! But the secret of success lies in what Mrs. Root said to the writer of this article, "I am not doing this primarily for money, as I earn little more than a stenographer's wage, but my object is really to help my brothers and sisters."

She has proved, too, what can be done with a small force of assistants, in a small area, in a small space of time, with a small allowance.

A SCORE CARD FOR EATING HOUSES.

The following score card for eating houses is the work of a class[1] in the department of household science in the University of Illinois which is studying special problems in the service of food. While some of the points listed as being discredits may seem to be stated somewhat baldly, a critical patronage of most of the cheaper eating places, and many of those not so cheap, will probably serve to justify the suggestions here offered.

Score Card.

		POINTS.
I	Building or Plant.	
	Accessibly located; wholesome neighborhood; building in sanitary condition; well lighted and ventilated.....	20
	Discredit;	
	Proximity to stable; laundry, renovating plants, etc. Dilapidation; absorbent walls, etc. Presence of flies; cockroaches; mice, etc. Direct communication with toilet room. All day artificial light.	
II	Character of working force and conduct of business.....	20
	Discredit:	
	Discourtesy; slovenliness; incompetence; dishonesty, etc. Bad health; evidence of skin disease, tuberculosis, etc. Acting as agents for laundries, clothing renovators, etc.	
III	Reception and general treatment of guests.....	5
	Discredit:	
	Lack of cloak-room facilities.	
	Lack of promptness in assigning places at table.	
IV	Conveniently located tables; comfortable chairs; clean linen; attractive china; good silver; and well arranged table...	10

[1] 14. Special Problems in Connection With the Service of Food.—This course deals with the problems of marketing, domestic storage, management of menus, and utilization of waste food materials, as modified by special conditions. Assistant Professor Van Meter.

Discredit:
Tables crowded together; lack of separate tables for individuals and small parties.
Clumsy china and worn plated ware.
Napkins in drinking glasses.
Array of "relishes" left on table.

V Food:
Good quality; well prepared; reasonable variety; good combination, flavor and amount 35
Discredit;
Cold or luke-warm dishes that should be served hot.
Half-melted desserts, soft butter, and wilted salads.
Undue number of side dishes.
Rank flavor and other indications of use of inferior materials, such as cheap baking powder, flavorings, tainted meats, rancid butter, etc.
Dishes of food, such as crackers, etc., standing uncovered from meal to meal.
Undue handling of food materials.
Alternating the handling of food materials and money.
Careless sneezing and coughing over the food.
Serving of oleomargarine without due notification.[2]

VI General Considerations.
Reasonable relation between charges made and service rendered 10
Discredit:
Discrepancies between advertised service and service as actually rendered.
Display of dummy menu cards.
Narrow margin of time for meals.
Permitting waiters to receive extra fees, tips, etc.

[2] Tenth Annual Report of Illinois State Food Commissioner. The Oleomargarine Law, page 443, Section 4.

A LETTER TO FOOD MANUFACTURERS.

The Department of Home Economics of the New York State College of Agriculture at Cornell University recently sent out the following letter to a number of food manufacturers:

DEAR SIR:

Knowing that as a manufacturer you are interested in securing properly trained employees, we address you on a subject of great educational interest to us and which we believe will be of equal commercial interest to you.

You may have observed that during the last few years considerable progress has been made in American schools and colleges toward the training of women for practical efficiency. A large part of this progress has been accomplished in the courses usually referred to under the names of domestic art and domestic science. Such courses are designed mainly to prepare women to be efficient in their homes. But there is no reason why they should not be equally serviceable in preparing women to be efficient in certain kinds of industrial money-earning work. The instruction given in the domestic science courses, for instance, relates particularly to food and it can easily be so extended as to give the pupil a thorough grounding in the commercial, as well as in the domestic, selection and preparation of food products. It is this aspect to which we wish especially to draw attention.

Manufacturers frequently make complaints with regard to the imperfect training of women for industrial work and with regard to their inadequate interest in such work. Both the lack of training and the lack of interest are to be deplored. There should be a coöperation here between employer and educator. The educator should keep in mind the needs of industry. The employer should explain those needs. We hope therefore that when you come to answer the enclosed questions you will feel yourself free to go beyond them, if you so choose, and to give us whatever suggestions may occur to you on the general topic of the preparation of women for industrial and commercial life.

(1) To how large an extent, in your factory, do you need people who are expert at devising recipes, at improving the mixtures of ingredients and the methods of cooking, at forecasting and meeting the changes in public taste, and, in general, at superintending the *technical* processes of getting your food products ready for the market?

(2) What is the scale of remuneration for such work?

(3) Are women employed by you at such work? Do you regard women as being competent to hold the higher technical positions in your industry? The management of the preparation of food has always been one of the occupations in which women have been employed **in the home**. Are there, in your opinion, good reasons why women are not suited to positions of technical management in the preparation of food **in the factory**? We should be glad to have you answer this question very frankly.

(4) If you had charge of the education of girls for self-support in the kind of work above outlined, what courses of study and practice would you lay out for them?

Yours respectfully,

D'AVENELS "EVOLUTION OF PRIVATE EXPENDITURES DURING SEVEN CENTURIES."

HELEN W. ATWATER.

The Vicomte d'Avenel, a French economist and educator, has recently been publishing in the *Revue des Deux Mondes* a series of articles entitled The Evolution of Private Expenditures During Seven Centuries.[1] He has collected facts from official reports, tax-lists, trade, market and sumptuary regulations, and also from private memoirs and especially such family budgets and accounts as have been preserved. Although naturally more material is available regarding the expenditures of kings and high nobles in the earlier periods, nevertheless there is considerable information concerning the cost of living among the lesser nobles and the bourgeoisie, and not a little regarding living conditions among all classes at different periods. The main purpose of the present articles is the development of a sociological theory, but many of the facts cited by the author are of interest to students of living conditions past and present.

The first article is entitled The Leveling of Pleasures and deals mainly with the changes which the spread of material comforts has made in the relative conditions of all classes of society, the consequent advantages being greatest among the poor.

Among all the changes those which affect the table have been of the greatest importance to the very poor, for the reason that in their budgets food holds an irreducible place. In the time of famine, it was the poor only who starved to death. A manual laborer in the fifteenth century spent a third of his wages for food, in the middle of the sixteenth, one-half, and from then until the French Revolution, nearly two-thirds. Nevertheless, the character of his food deteriorated rather than improved; meat had practically disappeared from his diet by the eighteenth century. In the case of the bourgeois and the noble, on the contrary, the cost of food lessened from century to century, though the price of individual food materials varied irregularly.

[1] *Revue des Deux Mondes*, 5th series, 51 (May 9, 1909); 54 (November 15, 1909); 56 (March, 1910).

The table of a high official under Louis XIII cost three times that of a man of similar income and position today.

In spite of the large amounts which they paid for their food, the upper classes were neither as fastidious nor as prodigal in their daily eating as one would be tempted to believe. Madame de Maintenon considered it exorbitant that her sister-in-law wanted preserves at "collation," or butter at breakfast. This seems to us a little severe in a household employing ten servants, whose daily expenditure for food materials amounted to 42 francs or 3.5 francs a person. During the last five, or even the last two centuries, rich and poor have changed the character of their food, but the change has been much greater in the case of the poor, as is seen from the second article which deals with the special food materials. Whereas the discovery and circulation of many new materials produced merely an economy for the rich, it procured new pleasures for the poor. They have gained a material advantage in that wealth is available to them which was formerly out of their reach and a moral advantage in that their condition differs much less from that of the upper classes.

The second article is a review of the changes in the food supply of the French people during the last seven centuries. The popular impression is that the people of previous centuries were much heartier eaters than those of our day, but a close analysis of the facts presented in the various records that have come down to us does not carry out this idea. The great feasts, both public and private, of the earlier centuries and the ceremonious meals of the court and the rich nobles presented very long and elaborate bills-of-fare, but judging from the size of the silver serving dishes used on such occasions the quantities served each person were much smaller than is the case nowadays. Moreover, although many dishes were presented to each guest, it was not expected that he should help himself to more than a few. The tremendous expenditure which the court and nobles were obliged to keep up as regards their table was due not so much to the amount of food served each individual as to the enormous number of people whom etiquette obliged the man of means and station to admit to his table. Both the number of dishes served and the number of persons fed at princely tables were greatly reduced during the last two or three centuries of the monarchical régime. Further there is reason to believe that even at the royal tables the cooking was poor and the quality of the food often inferior.

The foods served in those days, though they may bear the same

name as those served today, differed very greatly in quality. What is ordinarily known as bread today, that is, bread made from fine wheat flour, was procurable in France only by the very rich up to the time of the French Revolution. Under Louis XV, it was made only by certain bakers who brought it to Paris only two days in the week. Today, on the other hand, almost every French family can get the fine wheat bread fresh every day. Beef and veal are today entirely different substances from what they were in previous centuries, as regards quality. Although the price of the animal per head has risen since the Middle Ages, the weight of the carcasses has more than doubled and there is no comparison between the number of cattle specially bred for the table today and those of earlier centuries. In fact the meat cattle of previous centuries were hardly more than wild cattle, and at the close of the old régime even this inferior meat was scarcer and dearer than during the Middle Ages. Lard, tallow, etc., two centuries ago were too expensive to be commonly used in cooking. It is only within the last fifty or sixty years that French cattle have been specially bred for food in any quantity, while the development of the art of slaughtering on a large scale is of even later date.

Although owing to the fasts prescribed by the church fish was more commonly eaten than at present, the kinds of fish were very few. Because of the poor transportation, good fresh fish was rare except at the seashore and on a few rivers. When it reached other parts of the country it was in such a condition that it would hardly pass for edible today, consequently salt fish was almost the only kind available and that was crudely salted. The maritime fisheries which are now so important an industry in France have doubled in importance during the last forty years and have completely changed the kind and character of the salted fish. The large private lakes or ponds maintained by the wealthy for a supply of fresh water fish were frequently leased at prices which show that the cost of such fish must have been almost prohibitive, except among the well-to-do.

Poultry has also changed in character and table quality. New varieties have been introduced, the art of fattening has been very greatly improved, and prices have fallen considerably.

The price of dairy products has not changed so greatly in the summer season, but the difference between winter and summer prices is much less than in former years. Until the last century, fresh butter was practically prohibitive in price during the winter. Under Louis XIV, butter from Vanvres which was considered best, and was almost

the only kind to be obtained sweet, cost 10 francs per kilo and it was only toward the end of the eighteenth century that dairymen in other parts of France learned how to make butter of equally good quality. The varieties of cheeses have greatly increased during the last century. Brie was practically the only one of the now famous kinds known in the fifteenth century. Many of those famous in the sixteenth century are now unknown while Roquefort, Pont-l'Eveque, etc., are of recent origin.

Out-of-season fruits, although known to a certain extent in the sixteenth century, brought such tremendous prices that they were available only to the very wealthy. It is only within the last fifty or seventy-five years that the art of forcing vegetables and small fruits under glass has been developed. The number of common vegetables has been very greatly increased during the last two or three hundred years. Beans, asparagus, melons, cauliflower, salsify, tomatoes, beets, peas have all been introduced since the sixteenth century. The greatest evolution in the matter of vegetables is due to the potato. This was accepted in France even more reluctantly than in most other countries of Europe, but the annual crop in 1815 had reached 30 million quintals and today amounts to 120 million. Rice was a rarity and luxury in France, even in the eighteenth century, and cost from 2 to 3 francs a kilo whereas today it has fallen to 75 centimes a kilo for the poorer qualities. In the sixteenth century the first attempt was made to cultivate strawberries in the garden. This industry has grown tremendously until today a veritable army of special workmen are required to pick the berries. Oranges cost 5 francs a piece in the fourteenth century and pomegranates 10 francs each. The consumption of oranges in France has tripled in the last twenty-five years. The importation of bananas has grown enormously during the same period.

The wines have changed character and origin; whereas formerly they were grown in any fairly favorable locality, they now tend more and more to be produced only in the south of France. Formerly very little wine was bottled and consequently much was wasted through deterioration in the casks The good wines have not greatly increased in price but ordinary wines have become much cheaper. Of course fortifying, etc., is more usual now. When tea was first introduced in 1648 it cost from 20 to 30 francs a kilo. It was boiled rather than infused and ordinarily drunk with equal parts of milk. Cocoa which was introduced by Spaniards in 1520 was early considered as a drug, opinion differing as to whether it was dangerous or beneficial.

Coffee introduced in the seventeenth century rapidly became popular. Its price has decreased and the amount consumed has increased steadily.

The third article in the series deals with the history of table service and cooking and incidentally with table manners. In 1500, we are told, Frenchmen of good breeding, like the Gauls at the time of the Roman conquest, ate with their fingers, drank, in due order of precedence, from a common goblet, and cut their food with the knives they wore in their girdles. Later a two-handled dish was provided for each couple and was considered a great mark of refinement. In 1763 an English traveler remarked that each Frenchman had his own cup at an inn table and not one shared by a dozen dirty mouths as in England. Among the poorer people, however, all drank out of the common pitcher. Forks were unknown until about 1650, and it was considered elegant to eat with three fingers, and not to dip them into the dish beyond the second joints. Another point of etiquette was for all who were to share the meal to wash their hands in each other's presence just before eating "whether this was necessary or not." Saint Simon speaks of the man who invented the modern form of fork as a person of "redoubtable cleanliness." Inventories of the property of kings and nobles show large amounts of gold and silver dishes, but these were mainly "show" or serving pieces and included few individual plates or spoons. Plates were never changed between the courses of even the longest banquet. Often, however, a large slice of bread was put on the plate, and the meat or other food was served on and eaten with this, a fresh slice being provided for each course. Bones, fruit and vegetable skins, etc., were simply thrown on the floor and scrambled for by the dogs, or the lower servants. This custom came to be considered inelegant among the wealthy, though it long survived among the lower classes, as did also the practice of using the edge of the table cloth as we use individual napkins.

Where the richest used dishes of silver, people in comfortable circumstances used some form of tin. It sometimes contained as much as four-fifths lead, and was occasionally melted down for bullets in a siege. Pewter was not made until the seventeenth century. The poor ate out of wooden dishes which were seldom renewed, though of course most difficult to clean. These cost as much as white glazed earthenware today. Pottery was too heavy, expensive, and breakable to be practicable for table use, and until the secret of using kaolin in the manufacture of porcelain was discovered in the eighteenth

century, the only fine wares were those imported from China. The modern processes of making cheap glazed crockery and plated silverware have been the most important factors in raising the general standard of table service, and both of these were inventions of the nineteenth century. It is said that five times as much silver is now annually used in France for plating alone as was used for all purposes two centuries ago. The use of glassware has passed through much the same general changes as silver. The masterpieces of the renaissance glass-blowers were mainly large showpieces, and what small table pieces were made were far too expensive for common use, even on princely tables, costing twice as much as the more durable wooden cups. Glass for windows and mirrors was also a comparatively late introduction; at the end of the seventeenth century there existed in Paris a company which set paper into house windows and was patronized mainly by the well-do-to. It is only within seventy-five years that such inexpensive glass as we now know has been produced.

There have been many changes of taste in the matter of cooking in the last centuries. Some of these are more curious than significant; as, for instance, that in the fifteenth century eggs cooked in rose-water were considered a great delicacy. Probably no one fact regarding the cuisine of the Middle Ages seems more striking than the fondness for spices. They were extremely costly, pepper, the cheapest of all, costing seven or eight times as much as today. They were, therefore, accessible only to the rich, and their use was considered a mark of affluence and especially desirable on ceremonious occasions. At a banquet given in 1514 where the total cost was 1160 francs, the accounts show 711 francs to have gone for spices. Saffron and flavors practically unknown today were used in great quantities in all kinds of cooking.

Much more important from an economic point of view than the change in such extreme tastes among the wealthy has been the decrease in the cost of salt, sugar, oil, vinegar, etc. Our author points out that the reduction of the salt tax was the only result of the Revolution which directly decreased the cost of living. Under the old régime, not only was the tax high, but each family was obliged to buy so much a person whether they wished to or not. Oil has come into common use in France only since the introduction of cotton-seed and other cheap oils has brought down the price, and there has been an improvement in the quality of olive oil. Olive trees were formerly

little cultivated in France and the oil was frequently fit only for burning.

During the Middle Ages sugar was a great luxury, costing as much as 30 francs a kilo. In the seventeenth century, people in easy circumstances could afford a little as a delicacy, but up to the eighteenth century it was sold only by pharmacists, and the use of sweet cakes, dragées, and other candies was a mark of wealth. The cheap method of refining and transporting cane sugar and the development of the beet sugar industry during the last half century have finally brought sugar and articles made from it within the reach of all. Eighty years ago the annual consumption in France was 2 kilos per head; it is now 16 kilos per head, and in England 40 kilos.

Cooking was poorly done in former times, even for the wealthy. Though families sent their roasts to the baker's to be cooked, the results were usually far from good.

From studies of private budgets of different periods it appears that formerly as much or more was spent for food than today, but that the money brought poorer returns both in quality and in quantity. In considering the material welfare of any period the standard rather than the mere cost of living must be considered. There can be no doubt that the standard of living has risen among all classes but most among the poor, and that in practically every instance the rise has followed some improved method of production.

SANITATION AND OTHER SIMILAR WORK IN MANILA.

The recently published report[1] of V. G. Heiser, director of health of the Philippine Islands, calls attention to improvements which have been introduced in market conditions, and gives an account of the Manila slaughterhouses, the work of the department of sanitation and transportation, the efforts made to overcome the dust nuisance in Manila, and the work generally along lines of public charities and correction.

As regards improvements in market conditions, food is now sold only from tables instead of "from the floor and filthy inclosed spaces under the tables," as was formerly the case.

"The fact that fresh meat in Manila can only be sold in a public market building has made its inspection effective and has given Manila an advantage which is enjoyed in only a few of the leading cities of the world. . . .

"These markets were freed from all inclosures and contrivances in which unsuitable food or filth might be hidden from view and concealed; the venders of the same class of goods were assigned to certain sections of the market, and were required to expose all food supplies on tables or pans and not on the floor; drains and receptacles were provided for refuse; the markets were well lighted; suitable tables, pans, racks, etc., were installed, and the premises, tables, and all utensils kept in a clean and sanitary condition. Wares not properly classified as food supplies were excluded from the market."

Market sheds and other improvements of a similar character have also been introduced.

"The question of the food supply of the inhabitants of a city is always an important one, and deserves close and careful study from many points of view, some of which pertain to the proper inspection of food so that no diseased, unsound, or unfit food is sold or consumed; the manner of handling and exposing food for sale; adequate and clean market buildings and fixtures; a proper and just system of assignment of space and privileges of vendors, whereby all dealers

[1] Ann. Rept. Bur. Health Philippine Islands, 1909, pp. 29-36.

or producers of food supplies can have ready access to the public to market their wares; and a proper supervision and control of the marketing of food supplies in so much as can be done to prevent the fostering of special privileges and the building up of monopolies in the sale of certain food supplies.

"The welfare of the people in any community demands that they should be protected from dealers of unwholesome food, should not pay unusual or exorbitant prices for food, and should be able to procure their food supplies within the limits of their own community.

"The markets of Manila have undergone a great transformation since the advent of Americanism, and when the plans now under contemplation are carried out, Manila may safely place these institutions in her list of attractions."

The department of sanitation and transportation "is under control of the city of Manila and is charged with the responsibilities of street sprinkling and flushing, street sweeping and gutter cleaning; the collection and disposal of garbage, house refuse, and dead animals; the filling of lowlands; the collection and disposal of night soil and public closets; the administration of the city pound; the sanitary care of markets and slaughterhouses; the transportation of meat; the care and administration of cemeteries; the maintenance and development of parks, trees and plant nurseries; the care of city walls; the improvement of public grounds; the administration of all land transportation of the city, and the service of this character for the Insular Government.

"The collection and disposal of garbage, house refuse, and dead animals is an important branch of the work with which this department is charged, and is carried on principally between 9 p.m. and 6 a.m. The garbage and refuse from dwellings, factories, shops, stables and similar places, are collected by carts which pass along regular itineraries, collecting the garbage and refuse placed on the curbing in separate receptacles as required by city ordinances. The material suitable for filling in lowlands is applied to that purpose, and the garbage, slops, and organic matter find their way to one of the two city crematories.

"Dead animals weighing thirty pounds or less are considered garbage and are deposited in the regular garbage receptacles. Those of greater weight are collected in wagons specially designed and constructed for this purpose, and are either burned or sold to factories to be manufactured into trade products.

"Night soil is collected by odorless excavators from vaults and cesspools, and by the pail conservancy system from premises where there are no closet systems installed The collections are emptied into tanks on the steam barge *Pluto* and carried out to sea. . . .

"The pail conservancy system will have to be maintained in the districts of light material even after the new sewer system [now being introduced] is in full working operation, both in the public closets and as a domiciliary sanitary measure. . . .

"The pail concervancy system as it is operated in Manilla is a clearly efficient method of sanitation second only to the water-closet system, and might well be adopted in many towns in the United States where earth closets are now permitted."

The efforts which have been made for dust suppression are as well worthy the attention of sanitary engineers elsewhere as in the Philippines.

"Much has been done in Manila during the past few years to overcome the dust nuisance. The department of sanitation and transportation of the city government has established a very thorough system of street sprinkling for the dry season. Last year this office issued a circular which was put into force by the executive secretary in all the public buildings of Manila, in which attention was called to the habit that had formerly prevailed of sweeping the floors without dust precautions while the employees were still at their desks, and the dangers thereof, and attention was invited to the fact that by reason of the prevalence of tuberculosis in the Philippines and of the careless habits in spitting, the dust of offices often became laden with the deadly tubercular bacilli which might enter the system by means of the inspired air. The circular enjoined that there should be no more dry sweeping in government buildings, and required that floors should be thoroughly sprinkled with wet sawdust before they were swept, and that they be not disturbed as long as there were any employees at their desks. On account of the fact that this new method of sweeping was not in accordance with the former custom, some opposition to it developed, but this finally yielded to persuasion, and now the method has been quite generally adopted in public buildings.

"This system of dust suppression is recommended to housekeepers and to stores, hotels, and other places where dust continues to be a source of danger."

INSTITUTIONS IN THE UNITED STATES GIVING INSTRUCTION IN HOME ECONOMICS.

MARIE T. SPETHMANN.

Office of Experiment Stations, U. S. Department of Agriculture.

(Concluded from the June Number.)

II. INSTITUTIONS FOR NEGROES.

1. INSTITUTIONS RECEIVING AID FROM THE FEDERAL GOVERNMENT.

STATE OR TERRITORY.	NAME OF INSTITUTION.	LOCATION.
Alabama	Ag. and M. College for Negroes	Normal
	Tuskegee Normal and Industrial Institute	Tuskegee Institute
Arkansas	Branch Normal College	Pine Bluff
Delaware	State College for Colored Students	Dover
Florida	Florida Ag. and M. College for Negroes	Tallahassee
Georgia	Georgia State Industrial College	Savannah
Kentucky	Kentucky Normal and Industrial Institute	Frankfort
Louisiana	So. Univ. and Agr. and M. College	New Orleans
Maryland	Princess Anne Academy	Princess Anne
Mississippi	Alcorn Agricultural and Mechanical College	Alcorn
Missouri	Lincoln Institute	Jefferson City
Oklahoma	Agricultural and Normal University	Langston
So. Carolina	Colored Normal, Industrial, Ag. and M. College of South Carolina	Orangeburg
Texas	Prairie View State Nor. and Ind. College	Prairie View
Virginia	Hampton Normal and Agricultural Institute	Hampton
West Virginia	West Virginia Colored Institute	Institute

2. INSTITUTIONS NOT RECEIVING AID FROM THE FEDERAL GOVERMNENT.

STATE OR TERRITORY.	NAME OF INSTITUTION.	LOCATION.
Alabama	Alabama Industrial School	Birmingham
	Calhoun Colored School	Calhoun
	Centerville Industrial Institute	Centerville
	Corona Industrial Institute	Corona
	Kowaliga School	Kowaliga
	Talladega College	Talladega
Arkansas	Lincoln High School	Fort Smith
	M. W. Gibbs High School	Little Rock
District of Columbia	Howard University	Washington
	Armstrong Manual Training School	Washington
Florida	Fessenden Academy	Fessenden
Georgia	Spelman Seminary	Atlanta
	Paine College	Augusta
	Dorchester Academy	McIntosh
	Negro Normal and Industrial School (Private)	Social Circle
	Clark University	South Atlanta
Indiana	High School	Evansville
	High School	Madison
Kentucky	Colored High School	Louisville
	Colored High School	Owensboro
Louisiana	Sabine Industrial Institute	Converse
	Straight University	New Orleans
	New Orleans University	New Orleans,
Maryland	Laurel Agr. and Industrial Institute	Laurel
	Colored Industrial Grammar School	Salisbury
	Normal and Agricultural Institute	Sandy Spring
Mississippi	Mt. Hermon Seminary	Clinton
	Rust University	Holly Springs
	Jackson College	Jackson
	Tougaloo University	Tougaloo
Missouri	High School	Chillicothe
	High School	Hannibal
	Lincoln High School	Kansas City
New Jersey	Ml. Tg. and Ind. School for Colored Youth	Bordentown
North Carolina	State Colored Normal School	Elizabeth City
	J. K. Brick Agr. Indus. and Normal School	Enfield
	State Colored Normal School	Fayetteville
	Henderson Normal Institute (Private)	Henderson
	Shaw University	Raleigh
	Saint Augustine's School	Raleigh
	State Normal and Industrial School	Winston-Salem
	Waters Normal Institute (Private)	Winton

STATE OR TERRITORY.	NAME OF INSTITUTION.	LOCATION.
Pennsylvania	Institute for Colored Youth	Cheney
	Downington Industrial and Agr. School	Downington
	Avery College Training School	Pittsburg
South Carolina	Brainerd Institute	Chester
	Avery Normal Institute	Charleston
	Penn. Normal Industrial and Agr. School	Frogmore P. O.
	Sterling Industrial College	Greenville
	Claflin University	Orangeburg
Tennessee	Lane College	Jackson
	Knoxville College	Knoxville
	Fisk University	Nashville
Texas	Samuel Huston College	Austin
	Tillotson College	Austin
	Bishop College	Marshall
Virginia	Christiansburg Industrial Institute	Cambria
	Temperance, Ind. and Coll. Institute	Claremont
	Dinwiddie Agr. and Ind. School	Dinwiddie
	St. Paul Normal and Industrial School	Lawrenceville
	Virginia Collegiate and Industrial Institute	Lynchburg
	Manassas Ind. School for Colored Youths	Manassas
	Norfolk Mission College	Norfolk
	Virginia Normal and Industrial Institute	Petersburg
	Union Industrial Academy	Port Conway
	Hartshorn Memorial College	Richmond
	Colored High School	Richmond
West Virginia	Bluefield Colored Institute	Bluefield
	Storer College	Harper's Ferry

III. INSTITUTIONS FOR INDIANS.

STATE.	NAME OF INSTITUTION.	LOCATION.
Arizona	Blackwater Day School	Blackwater
	Navajo Training School	Fort Defiance
	Moqui Indian Training School	Keams Cañon
	Indian Training School	Leupp
	Fort Mohave Indian School	Mohave City
	Colorado River Indian School	Parker
	Phoenix Indian School	Phoenix
	St. John's Mission School	Phoenix
	Pima Indian Training and Industrial School	Sacaton
	Tolchaco Industrial School	Tolchaco
	Havasupai Indian School	Supai

STATE.	NAME OF INSTITUTION.	LOCATION.
Arizona	Methodist Industrial School (for Mexican girls)	Tucson
	Truxton Cañon Indian School	Valentine
	Tucson Day School	Tucson
	Fort Apache Indian Training School	Whiteriver
	Fort Yuma Indian Training School	Yuma
California	St. Boniface's Industrial School	Banning
	Cahuilla Day School	Cahuilla
	Round Valley Indian School	Covelo
	Indian Industrial School	Fort Bidwell
	Industrial Training School	Greenville
	Capitan Grande School	Lakeside
	Pala Indian Day School	Pala
	Volcan Day School	Santa Ysabel
	Soboba Indian Day School	San Jacinto
	La Jolla Indian Training School	Soboyame
Colorado	U. S. Indian School	Grand Junction
	Indian Training School	Navajo Springs
Idaho	Fort Lapwai Indian School	Lapwai
	Fort Hall Indian Training and Industrial School	Rossfork
Kansas	Haskell Institute	Lawrence
Michigan	U. S. Indian Training School	Bay Mills
	Mount Pleasant School	Mount Pleasant
Minnesota	Cass Lake Indian School	Cass Lake
	Nett Lake School	Nett Lake
	Pipestone Indian Training School	Pipestone
	U. S. Indian Training School	Red Lake
	Vermillion Lake Indian School	Tower
	White Earth Boarding School	White Earth
Montana	Holy Family Mission	Family
	Fort Belknap Indian Training and Industrial School	Harlem
	Poplar River Training School	Poplar
	St. Paul's Mission	St. Paul's
	St. Xavier's Mission	St. Xavier
Nebraska	Genoa Indian Industrial School	Genoa
	Santee Normal Training School	Santee
Nevada	Fort McDermitt Indian School	McDermitt
	Western Shoshone Indian School	Owyhee
	U.S. Walker River Indian Training School	Schurz
	Carson Indian Training School	Stewart
	Nevada Boarding School	Wadsworth

STATE.	NAME OF INSTITUTION.	LOCATION.
New Mexico	U. S. Indian School	Albuquerque
	Zuni Indian Boarding School	Blackrock
	Isleta Day School	Isleta
	Jewett Navajo School	Liberty
	Mescalero Indian Industrial School	Mescalero
	Rehoboth Mission School	Rehoboth
	Indian Industrial School	Santa Fe
	St. Catherine's Industrial School	Santa Fe
	Government Indian Day School	Zuni
North Carolina	Indian Industrial School	Cherokee
North Dakota	No. 2 Day School	Belcourt
	No. 4 Day School	Belcourt
	Fort Berthold Industrial School	Elbowoods, via Bismarck
	Indian Industrial School	Fort Totten
	U. S. Standing Rock Indian Training School	Fort Yates
	No. 3 Day School (Indian)	Laureat
	Wahpeton Indian School	Wahpeton
Oklahoma	U.S. Kiowa Indian Training School	Anadarko
	Arapaho City Schools	Arapaho
	Chilocco Indian School	Chilocco
	Cheyenne and Arapaho Indian Industrial School	Darlington
	Pawnee Indian Training School	Pawnee
	Red Moon Indian School	Hammon
	Otoe Boarding School	Otoe
	Osage Boarding School	Pawhuska
	St. Mary's Academy Sacred Heart	Sacred Heart
	Shawnee Indian School	Shawnee
	Sac and Fox Indian Industrial School	Stroud, RFD 2
	Murrow Indian Orphans' Home	Unchucka
	Kaw Indian Training and Industrial School	Washunga
	Ponca Indian Training School	Whiteagle
	Seneca Indian School, Quapaw Agency	Wyandotte
Oregon	Salem Indian School	Chemawa
	Klamath Indian Training School	Klamath Agency
	Umatilla Indian Industrial School	Pendleton
	Warm Springs Indian School	Warmspring
Pennsylvania	U. S. Indian School	Carlisle
South Dakota	No. 24 Day School	Allen
	No. 8 Indian Day School	Cherry Creek
	Cheyenne River Boarding School	Cheyenne Agency
	Crow Creek School	Crow Creek
	Red Leaf Day School	Cutmeat

STATE.	NAME OF INSTITUTION.	LOCATION.
South Dakota	Cutmeat Day School	Cutmeat
	Upper Cutmeat Day School	Cutmeat
	No. 2 Day School	Dupree
	Indian School	Flandreau
	No. 18 Day School	Kyle
	No. 19 Day School	Kyle
	No. 23 Day School	Kyle
	No. 29 Day School	Kyle
	No. 14 Day School	Lacreek
	Lower Brule Boarding School	Lower Brule
	No. 10 Day School	Manderson
	No. 12 Day School	Manderson
	Black Pipe Day School	Norris
	Corn Creek Indian Day School	Norris
	Oahe Industrial School	Oahe, near Pierre
	No. 3 Day School	Pine Ridge
	Indian Day School No. 5	Pine Ridge
	No. 6 Day School	Pine Ridge
	No. 25 Day School	Pine Ridge
	No. 26 Day School	Pine Ridge
	No. 15 U. S. Indian Day School	Porcupine
	Rapid City Indian School	Rapid City
	Rosebud Boarding School	Rosebud
	"He-Dog's Camp School"	Rosebud
	Sisseton Boarding School	Sisseton
	Indian Training School	Springfield
	Immaculate Conception School	Stephan
	No. 7 Day School	White Horse
	White Thunder Day School	Wood
	Uintah Boarding School	Whiterocks
Washington...	Chehalis High School	Chehalis
	U. S. Colville Indian Training School	Fort Spokane, Miles P. O.
	Quileute Day School	La Push
	Neah Bay Indian School	Neah Bay
	Tulalip Training School	Tulalip
Wisconsin	U. S. La Pointe Indian Training School	Ashland
	Academy of St. Joseph	Green Bay
	Hayward Training School	Hayward
	Oneida Indian School	Oneida
	Lac Courte Oreilles Government Day School	Reserve
	Tomah Indian Industrial School	Tomah
	Wittenberg Boarding School	Wittenberg
Wyoming.....	St. Stephens Mission Boarding School	St. Stephens
	Shoshone Indian Mission School	Wind River

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I. The Selection of a Home.

(With special reference to health.)

1. Sunlight; its benefits, and how to get it. 2. Ventilation of the House and Plans for Life Out-of-doors. 3. How shall we Heat our Houses? 4. How shall we Light our Houses? 5. How shall we get enough Moisture, and not too much? 6. Points on Plumbing.

Textbook: Household Hygiene, by S. Maria Elliott, Simmons College. Published by the American School of Home Economics, Chicago. Price $1.50.

II. The Furnishing of a Home.

(With special reference to beauty.)

1. Learning of Nature. 2. The Right Use of Materials. 3. Harmony of Color. 4. Beauty of Form and Structure in House Furnishings; Applied Ornament. 5. Wall Coverings and Rugs. 6. Selecting and Framing Pictures.

Textbook: The Furnishing of a Modest Home, by Fred. H. Daniels. Published by the Davis Press, Worcester, Mass. Price $1.00.

III. The Care of A Home.

(With special reference to economy of time.)

1. The Important Subject of Floor Coverings. 2. The Advantages and Disadvantages of Small Kitchens. 3. Dust and its Dangers. 4. Garbage and Household Waste. 5. New Household Devices.

Textbooks: The Healthful Farmhouse, by Helen Dodd. Published by Whitcomb and Barrows, Boston. Price 60 cents.

The Up-to-date Home, Bulletin of the American School of Economics, Chicago. Price 10 cents.

Household Management, by Bertha M. Terrill. Published by the American School of Home Economics, Chicago. Price $1.50.

IV. Providing the Daily Meals.

(With reference to health, attractiveness and economy of labor.)

1. Shall we buy Household Supplies in Large or Small Quantities? 2. Knowledge of Food Values an Aid to Marketing. 3. Knowledge of Food Values an Aid to Cooking. 4. Food for Children;—the Lunch Box. 5. Food for the Sick. 6. The Art Side of Serving Food.

Textbooks: Food and Diet, by Alice P. Norton, of the University of Chicago. Published by the American School of Home Economics, Chicago. Price $1.50.

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The Fuels of the Household, by Marian White. Published by Whitcomb and Barrows, Boston. Price 75 cents.

The Principles of Cookery, by Anna Barrows. Published by American School of Home Economics, Chicago. Price $1.50.

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AMERICAN HOME ECONOMICS ASSOCIATION. FOURTH ANNUAL MEETING.

WASHINGTON, D. C., DECEMBER 27–30, 1911.

The American Home Economics Association will hold its fourth annual meeting at Washington, D. C., as one of the affiliated societies of the American Association for the Advancement of Science, which meets in Washington December 27–30, 1911.

Meetings will be held at the Henry D. Cooke School, 17th Street and Columbia Road. Headquarters will be at Hotel Gordon, 16th Street between I and K Streets N. W. Dr. C. F. Langworthy, First Vice-President of the Association is Chairman of the local committee. Requests for information should be addressed to him at U. S. Department of Agriculture, Washington, D. C.

PROGRAM.

WEDNESDAY, DECEMBER 27.

2:30 p.m.—Meeting of Executive Committee at Hotel Gordon.

3:30 p.m.— Meeting of Council at Hotel Gordon.

THURSDAY, DECEMBER 28.

9:30 a.m.—Convention called to order by the President, Miss Isabel Bevier, University of Illinois.

Paper—Bio-chemistry in the College Curricula in Women's Colleges, Miss Louise Foster, Dept. of Chemistry, Smith College.

Paper—Metabolism Experiments, Miss Alice F. Blood, Simmons College.

Paper—Some Chemical Differences Between Short and Long Process Breads, Miss N. E. Goldthwaite, University of Illinois.

Announcements.

2:30 p.m.—Round Table, in charge of Miss Abby L. Marlatt, University of Wisconsin.

Topic, The Elementary Work in Preparation of Food in College Classes. Participated in by Miss E. C. Sprague, University of Chicago; Miss May B. Van Arsdale, Teachers College; Miss Catherine Mulligan, University of Tennessee; Mrs. Mary Pierce Van Zile, Kansas State Agricultural College.

8:00 p.m.—Reception at Henry D. Cooke School by the Home Economics Association of Washington, D. C. Address by Dr. W. M. Davidson, Superintendent Public Schools, Washington, D. C.

FRIDAY, DECEMBER 29.

9:30 a.m.—General Session, in Charge of Administration Section. Mrs. Mary H. Moran, Chairman, N. E. Kitchen, Boston.

Topic.—School Lunch Rooms, Their Equipment and Organization.

10:30 a.m.—Report of Committee on Entrance Requirements. Miss Jenny Snow, Chairman, University of Chicago.

Report of Committee on Legislation. Dr. B. R. Andrews, Chairman.

Report of Committee on Finance.

Report of Committee on Journal. Discussion of the report.

Discussion of Report of Committee on Nomenclature, reported at San Francisco.

Changes in Constitution. New Business.

1:00 p.m.—Annual Luncheon at Hotel Gordon.

3:30 p.m.—Round Table on the Teaching of Applied Art to College Students. Participated in by Miss Alice Houston Craig, College of Industrial Arts, Denton, Texas; Miss Grace G. Denny, University of Wisconsin; Miss Ella J. Spooner, Simmons College; and others.

8:00 p.m.—Public Meeting. Education and Home Economics, with address of welcome, Philander P. Claxton, U. S. Commissioner of Education. Response, Miss Bevier. Paper, Home Economics and Culture, Mrs. Mary H. Abel, Editor, JOURNAL OF HOME ECONOMICS.

SATURDAY, DECEMBER 30.

9:30 a.m.—Extension Work, in Charge of Miss Rachel H. Colwell.

Extension Work in Kansas, Mrs. Mary P. Van Zile; in Minnesota, Miss J. L. Shepperd; in West Virginia, Miss Colwell.

Unfinished Business. Report of Nominating Committee. Adjournment.

The program as arranged will give opportunity for attending some of the public meetings of the other affiliated societies of the American Association for the Advancement of Science.

REPORT OF THE SAN FRANCISCO MEETING.

HELEN LOUISE JOHNSON.

The Education Section of the American Home Economics Association met in San Francisco, July 11–13, in conjunction with the National Education Association. The program has been printed in the October Journal (page 409), as has also an account of the first meeting (page 400), devoted to exercises in memory of Mrs. Richards.

On Tuesday evening an informal dinner was given at the Teachau Tavern for the visiting delegates, teachers of Home Economics and visiting friends. A large number attended and a most enjoyable time was passed. All present were called upon to give their names, the institution from which they were graduated or at which they were then studying, and where they were located. It proved most interesting to meet so many from isolated places who obviously were getting inspiration from meeting and knowing those engaged in the same work.

On Wednesday, July 12, the meeting was called to order by President Bevier, who introduced Dr. A. C. True of the U. S. Department of Agriculture. Dr. True presented the paper on The College Curriculum in Home Economics printed on page 421 of this issue.

A paper on the Home Economics movement, by Miss Bevier, followed. Miss S. Maria Elliott of Simmons College, presented a paper entitled A Four Inch Lesson in Health and Economy (see page 428).

The chair was then given to Miss Ednah Rich of the State Normal School of Manual Arts and Home Economics of Santa Barbara. Miss Rich first spoke of the importance of the teaching of Home Economics, how it must be closely guarded from wrong influences and tendencies, and of its correlation with vital civic things and home interests. "Woman's Rights," in her opinion, are to know, to appreciate, to enhance, and to enrich home things.

In the absence of Miss Sarah M. Hummel, who was unable to be present, Miss Ellen M. Bartlett, supervisor of Home Economics in the San Francisco schools, was introduced. Miss Bartlett then gave details of the San Francisco parental school, which presents many

peculiar and interesting problems. This school is situated in the midst of the burned district, a crowded section where home habits and surroundings of the students made many special kinds of help necessary. The students, who are limited to boys, suffer from malnutrition and many are lacking in the ability to earn a living. They are taught to cook, partly for themselves, in part because cooks are in demand in the lumber and mining camps. In order to learn how best to teach them with limited food materials and equipment, Miss Bartlett and her sister visited and studied the methods of teaching the soldiers at the Presidio. She explained the beginnings of the lessons and later on gave details of cost. The boys pay five cents a week, which covers the cost of materials for their lunches, but not the entire outlay, hence the boys are encouraged to reduce the cost in other ways. The cost is about two cents for three meals per person and the foods includes beef stews, beef loaf, macaroni and tomatoes, corn bread, muffins, beans, and dried fruits, with variations according to the left-overs from day to day.

Miss May Secrest of the California Polytechnic School then described certain schools which she had closely observed in foreign countries, among them a public school in Japan and a private school in Naples. Mrs. Lulie Robbins of New York City followed with a description of the work done in the Speyer School, the experimental school of Teachers College, particularly in regard to the evening school and afternoon playroom for children.

Miss Rich then introduced President Kerr of the Oregon Agricultural College, who talked of the importance attached to Home Economics work in Oregon and stated that work had been carried on in the college since 1888, a surprise to the Easterners present. Considerable work is being done, and recently stress has been put on the promotion of the work in the public schools, both elementary and high. He especially emphasized the change of thought in the last ten years in the development of the idea that women are entitled to a training for their own work.

The meeting on Thursday was addressed by Prof. M. E. Jaffa of the University of California, who spoke on Nuts and Fruits as Food, and by Miss Ellen A. Huntington of the Agricultural College of Utah, whose paper on the Application of Science to the Housekeeper's Daily Problems appears on page 440 of this issue.

Miss Bevier reported that the Graduate School of the Association would meet as usual with the Graduate School of Agriculture in 1912,

thereby receiving the benefit of its lecturers and laboratories. Mrs. Alice Peloubet Norton of Chicago University has consented to take the chairmanship of the committee in charge, made vacant by the death of Mrs. Richards. The Graduate School will meet at East Lansing, Mich., with the Michigan State Agricultural College and Mrs. Norton is already in correspondence with Miss Gilchrist, Dean of Women, concerning plans. Later announcements will be made through the JOURNAL.

Resolutions were presented expressing to Miss Bartlett, Miss Rich, Miss Pansell, President of the California Division of Household Arts, and their co-workers, the sincere appreciation of the members for their efforts, through which the meetings had been made so successful.

Miss Bevier again called attention to the plans for the memorial fund and for the Life of Mrs. Richards, the first volume of which is to be issued early in 1912. The question of the support of the JOURNAL was discussed by Miss Elliott and the interest of all women solicited. The formation of a California State Association was also advocated.

Following announcements as to other meetings of the Association, the section adjourned.

SECOND ANNUAL MEETING OF THE AMERICAN ASSOCIATION FOR STUDY AND PREVENTION OF INFANT MORTALITY.

HOTEL LA SALLE, CHICAGO, NOVEMBER 16–18, 1911.

THURSDAY, NOVEMBER 16.

2:30 p.m.—Meeting of section on nursing and social work.

4:00 p.m.—Meeting of executive committee.

5:00 p.m.—Annual meeting of board of directors.

8:15 p.m.—Opening session. Addresses by President Chas. R. Henderson, Dr. George R. Young, Commissioner of Health, City of Chicago; Dr. Hastings H. Hart, New York.

FRIDAY, NOVEMBER 17.

10:30 a.m.—Section meetings.

2:30 p.m.—General session.

Report of committee on birth registration, Dr. W. R. Batt, chairman.

Reports and resolutions from sections on eugenics; midwifery; nursing and social work.

5.00 p.m.—Annual business meeting of the association.

8:15 p.m.—Popular meeting—Addresses by Miss Jane Addams, Dr. W. A. Evans, of Chicago; Dr. H. J. Gerstenberger, Cleveland; Dr. J. W. Schereschewsky, U. S. Public Health and Marine Hospital Service, Washington, D. C.

SATURDAY, NOVEMBER 18.

9:00 a.m.—Meeting of board of directors for election of officers, etc.

10:30 a.m.—General session.

Reports and resolutions from sections on city milk supply; housing; continuation schools of home making.

Resolutions; announcements; closing.

Afternoon—Meeting of executive committee.

At the section meeting, Friday, November 17, on education, and continuation schools of home making, the topic discussed was as follows: "Since the great majority of children leave school before sixteen years of age, and there is a considerable interval before marriage, should school boards create continuation schools of home making where girls (women) with grammar school education (more or less) can receive, even several years after leaving school, free instruction in housewifery, care of children and related matters, thus bringing instruction near the time when it is needed for use? Outline a course for continuation schools of home making."

This concerns girls of marriageable age, even married, not school children; the well-to-do, not the poor alone; the fairly well educated as well as the little educated; those earning wages and those not doing so. The need of such schools is quite universally admitted. Among the chief points for discussion were the practicability and relative values of day instruction, evening classes, and part-time schools; of instruction in class rooms, or in model houses and flats, or in pupils' homes; of details of the curriculum. One question was how to teach the care of infants and children. Is there a more effective and practicable method of public instruction in mothercraft than to co-ordinate the work of the pupils with the service in regular nurseries, hospitals, and institutional homes? Or with the work of either city or school visiting nurses or those supplied by private agencies?

The round table was led by Prof. Marlatt and among those taking part were the president of the American Home Economics Association, Prof. Isabel Bevier, of the University of Illinois; the supervisor of household arts in Chicago public schools, Miss Mary S. Snow; Dr. Fletcher B. Dresslar of the United States Bureau of Education; Dr. Helen MacMurchy, medical officer of the board of education, Toronto, Canada; Mr. Charles McCarthy, secretary of the Wisconsin commission on industrial training; Miss Adele Barrett, president of the Chicago Association of Practical Housekeeping Centers; Prof. J. H. Wright, biologist, Mechanics Institute, Rochester; Prof. Phelps, department of biology, Michigan State Normal College; Dr. Marion Talbot, dean of women, Chicago University; Prof. Frances Squire Potter, university extension work; and Prof. Edna D. Day, department of Home Economics, University of Kansas.

The findings of the conference were summarized and presented briefly at the public session, Saturday morning by Dr. Putnam, Dr. Dresslar, and Prof. Marlatt, followed by general discussion.

EDITORIALS.

Fourth Annual Meeting.

The attention of all members of the American Home Economics Association is called to its Fourth Annual Meeting to be held in Washington December 27–30. The program, preliminary announcement of which is made on page 495, promises to be a good one. The meeting of the American Association for the Advancement of Science at the same time and place during the same week will afford an unusual opportunity to hear of the latest work of investigators in many lines.

The city of Washington has many attractions to offer. It is expected that the final program will be ready for distribution by December 1.

The members of the local committee are Dr. C. F. Langworthy, U. S. Department of Agriculture, Chairman; Miss Emma S. Jacobs, Director of Domestic Science, Washington Public Schools; and Miss Alice Faye Seiler.

Requests for information may be addressed to either Dr. Langworthy or Miss Jacobs.

ISABEL BEVIER, *President.*

"One View of Domestic Science."

When we read in the *Atlantic Monthly* for October an article with this title and learned that its author was "a believer in Domestic Science" and that she holds "much higher ideals of it than do its professional advocates," we felt sure that from a new quarter light was to be shed on questions of moment. For Miss Harkness is a teacher of Latin. Perhaps a ripe educator trained in traditions that have always been claimed to make for the highest culture was to join our ranks and labor with those who are laying the foundations of this newest of the applied sciences! But no, Miss Harkness attacks courses in Domestic Economy as wholly lacking in disciplinary or cultural value and, still more, as cheating the child out of the time for mathematics and Latin. Her remarks seem to be based, unfortunately, on so narrow and mistaken a knowledge of what

such courses really are in any first class school as to render her suggestions of no value; any one of dozens of school catalogues we could name would have given her the needed facts on which to base a criticism that might have proved most suggestive.

That the so-called practical studies may be so taught that they "train for power" and are "mentally nutritive" has been proved again and again, and the same is true of their cultural value; that they are in reality always so well taught that these ends are gained we cannot claim, but the ideal is clearly held and is being more and more approximated; even Latin is not always so taught as to gain these ends, for in many hands it is the mere husks and bones of learning and loathed by the student. These and many other studies furnish the material for culture; success depends on the system and the teacher. "*Die Kultur*," said an eminent German physiologist in our hearing, "*ist keinem Stande eigen*"—"culture is the exclusive possession of no one class;" some degree of it may come through many channels even to the toiler whose days are brightened by the memory of precious stolen hours spent with poet or philosopher whose words have kindled an ardent mind.

But the real question at issue is this: In meeting the modern demand that courses of study shall enable the youth to understand and control his increasingly complex environment, can we expect him at the same time to enter deeply into the life of the past and to spend years in acquiring the classic languages? Would that it were possible, that we need miss out of general education none of the great lessons to be learned from "the glory that was Greece and the grandeur that was Rome!" But art is too long and time too fleeting, the decision is already made for the great majority of students. The English universities, for centuries the unyielding strongholds of the classics, are beginning to feel the rivalry and the stern rebuke of great commercial and industrial schools that have sprung up at their very doors; that enlightened nation, Germany, has already yielded to the demands of its people and has broadened the once rigid requirements of the *gymnasium* and has also established schools of equal rank and honor wherein industrial courses and modern languages hold the front. And yet the most advanced educators do not despair of the future of mental training and culture, for the new may reveal rich possibilities. The American thrush has been adjudged a better singer than the Thracian nightingale and a Keats may yet immortalize it.

At the close of Miss Harkness' article we find its real kernel. She has laid out work for the advocates of Domestic Science. It shall be their duty to construct a wholly new system of housekeeping which shall free women to enter on outside careers, for the home is a "devouring monster" and it is making brilliant women "kitchen-minded." She even says that she knows "good housekeepers whose conversation is not up to their biscuits!"

It is truly unfortunate to be kitchen-minded or parlor-minded or library-minded or anything but broad-minded, but it may not be possible in this imperfect life to quite keep the balance; the pressure of earning a living together with other cramping conditions may quite often force our conversation to a level below our biscuits, in whatever oven they may be baked. Only the professional entertainer could be an exception and he furnishes no biscuits for comparison.

As to the gifted women who find their true expression in some form of art or science or public service and who yet have normal desires for love and home, their number is relatively small and they have always been able to sing, to write, to act, to paint while the kettle has someway kept on bubbling without their immediate supervision. There are a far greater number who have the longings without perhaps the marked talents for a chosen career and who require at the same time as their right the emotional side of domestic life but do not wish to face what have been considered its duties. They say that the essentials of home-life are weighted with a complicated and out-of-date system. We would remind them that excellent experimental work undertaken in these very schools of Domestic Science is doing much to simplify and enlighten the present system, but when the best has been done, old-fashioned duties and tasks will still remain. This is especially true for those living in the open country and very small towns, where dwell over fifty per cent of our population. We must always remember that the function of emotion is to stimulate to the joyful performance of some outside expression of ourselves; when disconnected with duties, it may degenerate into emotionalism. Precious things are only to be bought with a price. Just as the price of fatherhood is toil for the maintenance of the family, so motherhood means a devotion to the thousand details, material and spiritual, of a life that is to bring the child through infancy and adolescence to normal development. Much may be safely delegated, but the truth remains that the number of hirelings, using the word in its best sense, who are intelligent, well-trained and conscientious, is strictly limited, there are never

enough to go around; and these supremely important relations of life require that the interested person, the woman in the case, must train herself to perform her duty to herself, to her own generation, and to the one to follow.

The Ellen H. Richards Memorial Fund.

[We quote the following from the circular that has been prepared by the committee on the Memorial Fund in order that the subscribers to this JOURNAL may all be made acquainted with this unique and most promising plan.

We take the liberty of suggesting that however well this committee may do its work, there is plenty of room for volunteer service. Names accompanied by dollars they will welcome from any quarter.]

Mrs. Richards' message to the women of America was: "Control the material things which lie about you, and make natural and social forces do your bidding, in order that you may have time and energy to make life beautiful and gracious and worth-while."

Confident that it is a duty and a privilege to make permanent the inspiration and influence of a life marked to an unusual degree by sanity, wisdom, and helpfulness, the American Home Economics Association proposes to raise a fund of $100,000 in memory of its organizer and former president, Mrs. Ellen H. Richards.

To make the memorial a worthy monument, it is to be of material "more lasting than bronze." The income from the fund—which is to be invested and administered by a responsible Board of Trustees representing Mrs. Richards' family and The American Home Economics Association—is to be expended in putting on a firm foundation the JOURNAL OF HOME ECONOMICS, the official organ of the Association, and in scholarships and prizes to encourage research work on problems relating to home life. Thus the fund becomes a living factor in the progress and development of the work that Mrs. Richards had most at heart and will go on accomplishing the results that she had set herself to attain. It will arouse an interest in the home; will awaken the American people to a realizing sense of the importance of the home to the community; will stimulate scientific study in its relation to home problems; and will provide a means for the wide dissemination of the results of scientific investigation for the practical help of the teacher and housewife. This fund, therefore, assures for her a sort of "earthly immortality."

In order that the gift may be a thoroughly democratic expression of appreciation and enthusiasm and that it may be participated in by all of Mrs. Richards' friends and by everyone interested to contribute toward the cause of right living, the money will be collected in one-hundred-thousand one-dollar subscriptions. Every cent given will go toward the fund, as a few of Mrs. Richards' personal friends will meet all the expenses connected with collecting the money.

In her latter years, Mrs. Richards came to feel that two of the most important problems that we as a people had to face were the preservation and betterment of our homes and the proper education and training of our children. To these two problems she decided she was called to devote whatever of life was left to her. It was her plan to give her time to the JOURNAL OF HOME ECONOMICS, and to discuss in its pages questions of education and home-making in a way to affect public school conditions and to help and inspire teachers and home-makers. Her unexpected and seemingly untimely death has deprived the country of her invaluable services. It is the purpose of this Memorial Fund to make possible the continuation of this work by other able and practical scientists and to insure the carrying out of Mrs. Richards' general plan.

DIRECTIONS TO SOLICITORS.

Make yourself familiar with the above information regarding Mrs. Richards and her work.

Call upon all the people on your list and ask each one to give you a dollar. If a person wishes to give more, let him give it in the name of some member of his family. *There must be a name for every dollar!* Collect the money on the spot and give a receipt for it. When you have called on all the persons on your list, make a complete report to your State Representative and send her the money you have collected. She will send you a recipt for it. If you know any men and women who would give, in addition to the ones on your list, ask them and send their dollar and their names to your State Representative. We want as many names and as many dollars as we can get.

Remember that the interesting features of this memorial are—

That it is a *living memorial* with constantly growing opportunities for service, and that it is so plastic that it can meet the needs of coming generations as well as of our own.

That it is a *democratic expression of interest* in which the richest can have no more part than the poorest.

That it is the purpose of the fund to be an agency in the work of preserving the American home and bettering it.

That anyone who believes in the home ought to be glad to give a dollar to this fund.

THE COMMITTEE.

DR. C. F. LANGWORTHY, *Office of Experiment Stations, Washington, D. C.*
MISS ISABEL HYAMS, *26 Wales Street, Dorchester, Mass.*
MISS EDNAH A. RICH, *303 Soto Street, Santa Barbara, Cal.*
DR. B. R. ANDREWS, *Teachers College, N. Y. City.*
MRS. WILLIAM H. BARRETT, *Chairman, 108 Johnson Street, Brooklyn, N. Y.*

ADDITIONS AND CORRECTIONS OCTOBER JOURNAL.

Additions to the list of dates and events in the history of the Home Economics movement.

1883—Miss Helen Abbott writes a paper on the nutritive value of condiments.

1897—Domestic science course established at Ohio State University.

1901—Home Economics Department is organized at Milwaukee-Downer College.

1902—Home Economics Department organized at University of Illinois.

1906—Miss Bevier and Miss Usher publish The Home Economics Movement.

1909—Home Economics Department organized at Cornell University and University of Wisconsin.

Additions and Corrections to the list of Mrs. Richards' published writings:

1881—The Chemistry of Cooking and Cleaning. Revised (with S. Maria Elliott) Home Science Pub. Co., 1897; third ed., revised, Whitcomb & Barrows, 1907.

1885—Food Materials and their Adulteration. 1898, Home Science Pub. Co. Revised, Whitcomb & Barrows, 1906.

1897—(With Sarah E. Wentworth). Report to his Honor the Mayor, and to the Institutions Commissioner, on the Dietaries of the Nine Institutions of the City of Boston. Second Ann. Rpt. Institutions Commissioner, Boston, 1897 (City Doc. No. 14).

1899—Cost of Living. Third edition, 1905.

1900—(With A. G. Woodman). Air, Water, and Food for Colleges. Revised 1904, 1909, John Wiley & Sons.

1903—(With Amelia Shapleigh). Dietary Studies in Philadelphia and Chicago, 1892–3. U. S. Dept. Agr., Office Expt. Stations Bul. 129.

1904—Art of Right Living. Whitcomb & Barrows.

1906—Good Luncheons for Rural Schools. Whitcomb & Barrows.

1911—Conservation by Sanitation. John Wiley & Sons.

NEWS FROM THE FIELD.

University of Illinois.

The department of household science announces a gain of 20 per cent in registration over that of last year at this time.

Two new names have been added to the list of instructors in the department, namely, Miss Cora E. Gray from the University of Chicago and Miss Pauline Wurster from the University of Michigan. Miss Usher is absent for the year on leave, and her work is taken by Miss N. E. Goldthwaite, who has been for three years research assistant in the department.

A new feature of the department is the introduction of the movable school in its extension work. The first one is to be held under the auspices of the County Y. W. C. A. of Woodford County at Minonk, Illinois, October 16–23. Plans for the annual School for Housekeepers to be held January 15–27 are also under way.

Columbia University.

A study of the economic value of household work is being made by John B. Leeds, as the basis of a doctor's thesis at Columbia University. Mr. Leeds has prepared a schedule which he is sending out to housekeepers, seeking information regarding the time spent in the various forms of household work, the methods of organization and management of the home, etc. Any reader of the JOURNAL who is interested may obtain a copy of the schedule by addressing Mr. J. B. Leeds, Kent Hall, Columbia University, N. Y.

Pratt Institute.

The School of Household Science and Art has taken on the management of the Institute Lunchroom, in order to give full time students in household science courses experience in large quantity cooking. A group of seven students goes in for a week, preparing all the food for something over two hundred people, and assisting in the service. The senior normal students have only the single meal, but the institutional household science students repeat the work at frequent intervals. Students in the last-named course also have experience in buying for the lunchroom, and the classroom work, and in keeping the accounts.

The Institute has installed a small laundry with machines run by electricity, so that students will be given practice in laundry work as it applies to institutions. The normal course in household art, reëstablished after a lapse of four years, will send its first class in June. The students do the practical work in dressmaking in the class with trade students.

University of Washington.

The department of Home Economics in the University of Washington was established in the fall of 1909. The principal purpose of the department is to train teachers. A four year teacher's course has been outlined, leading to the degree of bachelor of science in Home Economics.

With the exception of two courses outlined in the department, candidates for the degree of B.A. may elect from the course in Home Economics studies to an amount not to exceed the equivalent of twenty-four unit-hours.

The department has grown rather faster than was anticipated. There were twenty-seven students in the department the first semester that the work was offered. A year later the enrollment reached 107.

This year one young man has been taking the courses on foods.

A Home Economics Club open to students of Home Economics was organized in the university, March 14, 1910. The aim of this club is educational and social. Some very interesting lectures have been given.

University of Wisconsin.

The Home Economics Department is equipping a model house for practice work. The building is a modern six-room cottage and will be fitted up to serve as an example of how the average American home should be furnished and managed.

King's College.

A recent number of *Nature* announces that 50,000£ has been raised for the endowment of home science in connection with the Woman's Department. The queen has consented to the use of her name in the soliciting of funds for a new dormitory to cost 20,000£, and a like amount is to be used for building and equipping laboratories. It is hoped to obtain 10,000£ additional to increase the funds for salaries and current maintenance.

The London *Times*, in an editorial note, warmly eulogizes the new departure, which it predicts "will be received throughout the country with universal satisfaction and sympathy."

Washington State Branch of the Association.

In response to an invitation extended by the Home Economics department of the University of Washington, a number of the teachers of domestic science and art in the state met December 29, 1910, at the time of the State Teachers' Association, and organized a State Branch of the American Home Economics Association. The following officers were elected:

Mrs. Ellen Dabney, supervisor of Household Science and Arts in the Seattle public schools, president; Miss Minerva Lawrence, teacher of domestic science in the Bellingham Normal School, vice-president; and Miss Grace K. McKibben, teacher of domestic science in the Seattle High School, secretary and treasurer.

The Branch Association held a two days' conference in Bellingham, April 13 and 14.

Home Economics Association of Washington, D. C.

On February 7, 1911, through the efforts of Miss Emma S. Jacobs, Director of Domestic Science, a local branch of the American Home Economics Association was formed. During the winter five meetings were held, principally to form a constitution and to elect officers. The officers elected were as follows: President, Miss Alice F. Seiler; vice-president, Miss Alice Burritt; recording secretary, Miss Nellie Rutherford; corresponding secretary, Miss Elizabeth Saxton; and treasurer, Miss Marion Pollard.

This year meetings will be held every other month beginning with October. All interested in the advancement of Home Economics will be asked to join and formal programs will be arranged.

The initial meeting of the season was held October 3. Miss Jacobs gave a history of the Home Economics movement, and Mr. H. Rabild of the Dairy Division, U. S. Department of Agriculture, discussed the production and care of sanitary milk. Plans were also formulated for the forthcoming meeting of the American Home Economics Association in Washington in December.

Traveling Cooking Schools.

Consul General Frank Dillingham, Coburg, in a recent issue of the Consular and Trade Reports, states that "the Government of the Duchy of Saxe-Meiningen has been for some time past experimenting with a plan for teaching girls in small country villages the art of cooking. At the present time there are three female teachers in the employ of the Government, each one of whom has a prescribed district. The course in cooking in a village lasts six weeks and each teacher visits seven villages, thus keeping her employed 42 weeks in the year, the remaining 10 weeks being her vacation. A teacher receives 159 marks ($37.84) for each course, or 1,100 marks per year. Each pupil pays 12 marks for the six weeks' course, or 48 cents per week, and is allowed to eat what is cooked at the school. No school is opened in a village unless at least 12 pupils are guaranteed in advance, because less than that number would not warrant the expense of starting it.

"I visited one of these schools at Veilsdorf a short time ago. It was held in a large room in a wing of the local inn, the school hours being from 8 a.m. to 5 p.m. Every article in the room was portable, capable of being easily transported to the next village with very little trouble or expense. In one corner of the room was a cooking stove, in which coal was burned, and at one side of the room was a large, wide bench, on which the vegetables, etc., were prepared, and above this bench hung the necessary cooking utensils. At one end of the room was a large cupboard filled with china and necessities for the table, and at the other end of the room there was a long table at which the pupils were sitting. The teacher had just given them the list of dishes that they were to cook that day for dinner, and was questioning them as to the market price of the articles needed for them. The cost of each ingredient used was reckoned, assuming that enough was to be made for a family of four. The dinner was to consist of soup, meat, rice, and dessert, the cost of which was reckoned at 24 cents for four people, or 6 cents for each person. Everything was taken into account when

reckoning the cost, including salt, spices, etc., as well as the cost of the fuel used. The Saxe-Meiningen Government supplies everything except the cups and plates, which the pupils like to bring themselves, because each pupil usually has her favorite china cup, saucer, and plate at home. In most of the villages in Thuringia the only kind of vegetable known is cabbage, or, in another form, sauerkraut.

"This traveling cooking school suggests and strongly encourages the growing of all the various kinds of vegetables, and as most of the houses have small plats of ground, either at the front or back, this suggestion has been generally observed. Strange as it may seem to Americans, scrambled eggs are an unknown dish in most of the villages in Germany. In fact, the bill of fare of the average German farmer is extremely meager and varies very little. It is said that the German farmer will eat only what he has from childhood, and great difficulty is, therefore, experienced by the teachers of the school in inducing their pupils to partake of any dish that is cooked for the first time. The cooking of the average housewife in a small village in Germany is so rudimentary that the latest attempts of the Government of the Duchy of Saxe-Meiningen to teach at least the rudiments of cooking to young country girls is considered worthy of commendation and support.

"A number of the principal citizens in the Duchy donate sums of money toward defraying the incidental expenses of the school as a sort of upkeep, but any and every deficit is met by the Government. At the end of the six weeks' course a large dinner is given, to which the mayor, parents of the scholars, and principal people of the village are invited. A small charge is made for this. Moreover, small sums of money are also usually given by well-wishers of the school who may be present."

Domestic Science in Y. W. C. A. Work in a Mill Village.

An interesting development in Y. W. C. A. work along domestic science lines has been reported from Monoghan Mills, a cotton mill village of South Carolina. Besides the usual library, gymnasium, shower baths, art courses, Bible study, etc., this association, by means of a domestic science secretary, carries on several different lines of work in Home Economics.

The association work begins with the little children, there being a Little Women's Club where the president, ten years old, conducts the meeting and the secretary, of eleven years, calls the roll and keeps the minutes. The children, as they grow too old for this club, are likely to be passed on into the club for junior girls, which continues the work of developing able and intelligent women.

In the public schools of the village cooking and sewing lessons are compulsory for all girls over eight years old. Thus, any girl who attends school fairly regularly, by the time she has finished the seventh grade should have a fair working knowledge of practical home cooking and of the simpler kinds of garment making. These village girls, therefore, have advantages enjoyed by few city girls. For those who have not had the advantages of the public schools, the association, in its night schools, offers similar courses in cooking and sewing, of which the domestic science secretary is the superintendent.

The especial original feature of the work of the association, however, is that which is carried on outside of the building, and which might be termed "extension work." The aim of this branch of the work is to be of assistance to the women who can not come to the association, especially the mothers and other home makers.

The domestic science secretary has organized neighborhood classes or, in some cases, has even gone into the individual homes to teach the women some of the more important principles of cooking and housekeeping. As a result of this there have been bread-making contests, etc., and a great demand has arisen for recipes for a variety of economical dishes; so much so that a cookery text book, full of practical every-day recipes and prepared to meet the special local condition has a large circulation in the neighborhood. As Miss Graves, general secretary of the association, says, "One who knows the monotony of the life of a busy housekeeper will realize that this coming together of neighbors to hear of outside things is helpful and enjoyable. Time was when it was not considered necessary, or even proper, for a woman to be interested in affairs outside her home, but today women everywhere recognize the importance of knowing what is going on about them, realizing that the labor of making bread, for instance, is really lessened if the woman has been refreshed by a bit of outside life."

A Meat Market that failed.

That beautiful meat store, in the heart of Chicago's shopping center, which was established to eliminate middleman's charges on merchandising and thus sell at lower prices, ran its brief career. And yet the trial of about eight months was long enough to afford a convincing test. In brief, the attempt was to establish practically the old-time market, such as still holds favor in some cities, chiefly in the South, where the producer and the consumer meet without middlemen, and a market basket and a purse are the essentials to the evening dinner. The telephone order, the free delivery, and the credit system were eliminated from the Chicago experiment.

Goods of quality attractively displayed at reasonable prices characterized this venture. These are essentials of successful merchandising. The opening was encouraging, but the new wore off soon. The shop was an anachronism—an error in the order of time. It was situated in the midst of the big department stores, the greatest retail merchandising establishments in the world, which have been built on modern methods—telephone order, free delivery, and credit. How much it cost its sponsors to attempt to turn back the hands on the clock of time they are not telling. Some cities yet maintain the old-time market places, and the family horse and phaeton, with the market basket aboard, jogs down to market daily or twice-weekly and the consumer trades directly with the producer; but the atmosphere of Chicago does not seem agreeable to that form of merchandising. The city built a splendid public market place a few year ago. It is now a manufacturing plant. Time and convenience seem to be worth money in Chicago.—*Breeder's Gazette*, 58 (1910), no. 22, p. 1154.

BOOKS AND LITERATURE.

Chemistry of Food and Nutrition. Henry C. Sherman, Ph.D., Professor in Columbia University. Pp. ix + 355. The Macmillan Co., New York. 1911.

A survey of the popular literature of the day, as it reveals itself in newspapers, magazines, and even books, will disclose the awakening of an intense interest in the subject of nutrition. Some of the current writing which aims to review the present status of scientific investigation in this field is commendable. This applies above all to the numerous excellent bulletins issued under government authority, which deserve wider attention than they yet obtain. The popularized contributions to much-read and quoted weeklies and monthly periodicals often suffer from the lack of competent criticism in their preparation. The writers "cover" an assigned task in a way intended to furnish so-called good reading as the foremost result, form being more important than accuracy of content. Diet fads are thus successively created or destroyed. The idea of reform itself seems to appeal to the American mind with greater fervor than the milder lessons of permanent truth. A further type of contributions is positively bad. In this class one meets with the fasting nonsense and other such "stuff" which is responsible for actual harm to individuals.

In view of this situation it is helpful to find a book like Professor Sherman's which even the more intensive student of nutrition can read from cover to cover without experiencing any serious upset of his stock of facts or theories. Although the volume can scarcely be classed as a work for beginners, it is presented in a "semi-popular" form that ought to excite an intelligent interest even in those who have not carefully reviewed the underlying science upon which nutrition study now rests. Happily the day has arrived when it is no longer necessary to make apology for the use of a chemical formula in a discussion of this subject.

The Chemistry of Food and Nutrition is presented in eleven chapters, together with a series of useful reference tables on the composition of food materials in an appendix. The topics under discussion include the organic food-stuffs and their behavior in the digestive tract; the fate of the food-stuffs in metabolism; the fuel value of food and the energy problems; food requirements and dietary standards; the rôle of the inorganic nutrients; and interesting criteria of the nutritive value of foods.

The author's reviews of the status of recent investigation are as a rule presented with commendable judgment and perspective. Indeed, this is a most valuable feature of the book, and is well exemplified in Chapter IV on the metabolism of the food-stuffs—an exceptionally effective introduction to the newer ideas. The historical résumés of various topics are in places involved in a series of details which make them less interesting to the

reader who is searching for the lessons of the book. This is true, for example, of the chapters on "mineral metabolism" which has, perhaps, been unduly emphasized, so that it must be regarded as one of the characteristic innovations of the volume. Of course, this can be excused because of the usual indifference to the problems of the inorganic salts in nutrition, and can be ascribed to Professor Sherman's well known interest as an investigator in this domain.

A few quotations may be selected to serve in place of detailed comment about various other features. The author writes: "Ordinarily it is best to use milk as the main source of protein throughout the whole of infancy and early childhood. Young and middle-aged people usually utilize quantities of protein considerably greater than they require. . . . . Elderly people show both a diminished protein requirement and a diminished power of dealing with excess. Surplus protein taken in the food is not so rapidly absorbed and katabolized, and, while there appears to be no essential difference in the form in which the nitrogen is finally excreted, the susceptibility to excessive putrefaction of protein appears to be increased. It would seem that in the dietary of the aged the protein should be reduced to at least as great an extent as are the calories" (p. 203).

The treatment of the much discussed problem of the protein standard is unbiased and reasonable. Incidentally it is interesting to find the expression "food habits" incorporated with the heading of a chapter on dietary standards. From statistical considerations the conclusion is reached that "the average of healthy men and women keep themselves slightly too thin while young, and allow themselves to grow slightly too stout as they grow older" (p. 217).

Regarding the comparative value of "organic" and "inorganic" iron preparations Professor Sherman has this to say: "Whether medicinal iron actually serves as material for the construction of hemoglobin is not positively known, but we have what appears to be ample evidence that food iron is assimilated and used for growth and for the regeneration of hemoglobin to much better advantage than are inorganic or synthetic forms, and that when medicinal iron increases the production of hemoglobin, its effect is more beneficial in proportion as the food iron is more abundant—a strong indication that the medicinal iron acts by stimulation rather than as material for the construction of hemoglobin. Evidently, then, we must look to the food and not to medicines or mineral waters for the supply of iron needed in normal nutrition" (p. 246). The table of the iron content of typical food materials on page 251 deserves careful study by students of dietetics. The conclusion is reached that "the typical American dietary does not contain any such surplus of iron as would justify the usual practice of leaving the supply of this element to chance. The available data rather indicate that foods should be selected with some reference to the kinds and amounts of iron compounds which they contain" (p. 252).

With respect to phosphorus it is concluded that "present food habits are more likely to lead to a deficiency of phosphorus compounds than to a deficiency of protein in the diet, and it is not improbable that many cases of malnutrition are really due to an inadequate supply of phosphorus compounds" (p. 281). Likewise it is suggested that "there should be more

attention to the choice of such foods as will increase the calcium content of the dietary" (p. 289). Here is a reminder that will bear frequent repetition: "A quart of milk contains rather more calcium than a quart of clear saturated lime water, and by far the most practical means of insuring an abundance of calcium in the dietary is to use milk freely as a food" (p. 291).

The reviewer believes that the splendid researches of Pawlow on psychic factors in secretion have often been clothed with too great practical import for the ultimate stages of digestion. He quite agrees with Sherman that "the data of quantitative digestion experiments upon healthy men afford little, if any, evidence in support of this view and much evidence that the coefficient of digestibility is but little influenced by the palatability of the food, or the monotony of a uniform diet, so long as the food is actually eaten and retained and does not undergo excessive bacterial decomposition. . . . . It seems probable that the psychic influences affect the comfort and rapidity of the earlier stages of digestion much more than the final percentage utilization of the food" (p. 306).

In reaching the conclusion that the well-being of the body would probably be in no wise impaired if it were possible to exclude all bacteria from the digestive tract, the author has referred to the familiar experiments of Nuttall and Thierfelder. The later contrary experiences of Schottelius with hens should, however, not be overlooked in this connection.

A companion volume containing a more detailed description of individual foods and the chemical and legal control of the food industry is promised.

LAFAYETTE B. MENDEL.

What to Eat and Why. J. Carroll Smith, M.D., Boston, Mass. Saunders, Philadelphia, 1911, 8vo. Pp. 310, $2.50.

A more correct idea of the contents of this book would be conveyed by the title, What to Eat in Disease and Why. Its purpose is to aid the physician in prescribing the diet of his patients. After a somewhat discursive introduction, common pathological conditions, such as obesity, emaciation, diabetes mellitus, etc., are discussed with regard to feeding problems. The usual causes, most frequent complicating factors, and typical digestive and metabolic disturbances of each disease are set forth, and an attempt made to show the bearing of all of these upon the choice of foodstuffs. A diet list and some practical suggestions about the preparation or eating of the foods conclude each topic. A consistent effort has been made to emphasize the fact that many factors are involved, and must always be considered.

Unfortunately, one's confidence in the author's scientific accuracy is disturbed by such statements as the following:

"Vegetable oil (olive) is not so well absorbed from the intestine as animal fats," (p. 16); "In deep, quiet sleep metabolic processes are most active," (p. 40); "Fruit sugars are of great value to alkalinize the blood," (p. 74). In regard to the first, fats of low melting point are the more completely absorbed (olive oil to 97.7 per cent according to Abderhalden); as for the second, "Metabolism is less active in sleep than in the waking condition, and the falling off is greater the sounder the sleep" (Tigerstedt); while the

third is manifestly impossible. It is also rather difficult to see why "an excess of fat in the system necessitates a great number of extra blood vessels" (p. 104).

The author quotes from many sources, but not always with the best of judgment, as when he suggests the adoption of Crichton Brown's criterion as to the amount of protein desirable in the diet, *i.e.*, that if a child one week old takes 2.07 grams per kilo of body weight, a man weighing 70 kilograms will need 145 grams. No account is taken of the high percentage of protein stored in the body of the growing child (see p. 18).

Certain other citations seem much out of place in so elementary a treatise, as for instance, "Rjasantzeff proved that bread produces more acid in the stomach (lactic and other acids) and more nitrogenous urinary waste than many other foods—three times more than milk, and as it is also rich in nucleins it is considerably restricted in the diet for gout." Pawlow declares that the gastric acidity is lowest with bread; inasmuch as it has about three times as much protein as milk, the 'discovery' of a greater amount of nitrogenous end products does not seem particularly startling; and the statement that it is rich in nucleins is false.

While not denying the importance of palatability, one would hesitate to accept the statement that a less amount of savory food will yield more calories than a much larger amount of an unpalatable food (p. 134).[1]

The book may commend itself to the practitioner on account of the author's practical experience, but it cannot be considered a reliable text for serious students of nutrition, in spite of its attractive title.

MARY SWARTZ ROSE.

Domestic Science. Ida Hood Clark, Supervisor of Elementary Manual Training in the Milwaukee Public Schools. Little, Brown and Company. 1911. Price $1.50 net.

According to the preface "There is need for a course of lessons in domestic science planned for the elementary schools. The course may be used in all grades above the third, and some of the lessons may be simplified and taught in the first three grades. These lessons may also be used in the first-year and second-year high school classes, and in other secondary schools. They are suitable for public, private, and rural schools."

This is a generous claim for any one text-book, but the next sentence is truly astounding and will not win favor from educators: "Teachers who have absolutely no knowledge of domestic science can teach them by carefully reading them over and performing the work as directed."

According to the interpretation implied by the table of contents domestic science is cookery and little else.

It is unfortunate that a book should be published which is worthless for teachers or pupils. No reputable school of domestic science would "pass" examination papers having as many errors in facts, English, and simple arithmetic as any chapter contains. The lack of logical sequence in the lessons is apparent from this order, "Gingersnaps, custards, soups, steamed

[1] Cf. Sherman, Chemistry of Food and Nutrition, p. 307.

brown bread, fruits, bacon, and fats;" or again, "Lamb stew, fruit cake, sugar and candy, cheese souffle, bread-making, angel cake, croquettes, muffins, vegetables."

The attempt to give the history of foods results in a curious hodge-podge of misinformation. There are few references to good authorities and these are indefinite. Even where the bulletins of the U. S. Department of Agriculture once or twice are mentioned no numbers are given. On page 116 we read "It will be seen from the table of analysis," etc., but no such table appears in the volume nor is there any definite reference to one outside. Aside from careless statement of fact and errors in dividing a home recipe for school use (see cake, custard, suet pudding, etc.) the recipes and general directions for work are expressed clumsily, not clearly, and in bad English.

The proof reading is inexcusable. A home recipe for junket reads,

"1 tp. milk 1 rennet tablet dissolved in 1 tbsp. water. 4 tbsp. sugar 1 tsp. flavoring." "Coloring matters used are caramel, turmene," (Is this tumeric?) The cranberry tree is spoken of as a species of "biburnum"(?). But this is less serious than the carelessness in stating temperature on p. 92, "body temperature (70°)"; p. 137, "body temperature, or from 65° to 70° F."; p. 124, "If the temperature is just right the mass of the omelet should be below 75°°; p. 276, "butter melts at 337 centrigrade."

Although almost every page will display errors to even the casual reader, here are some quotations which may indicate the general style of the book.

"We must learn physiology, the most important of all studies, wisely through an interest in our own growth in stature and in power, and this must come through nutrition." "When boiling place ingredient in water. Finish discussion while ingredient is cooking."

"Nitrogenous and carbohydrate principles are the two most important in cŏokery."

"Flour and very hot fat form a soluble mixture, dextrine, which is dissolved in liquids forming a smooth product like gelatine."

"Eggs possess their highest nutritive value when raw. Albumen subjected to a very high temperature of heat becomes indigestible. The yolk of the egg is rich in fat and in sulphur and therefore the freshness soon departs, so that it should not be retained in the stomach any longer than the average time for digestion. The white contains about two parts fat while the yolk contains about thirty parts."

"In the early settlement of our country, by the Indians and Colonists, places near rivers that contained fish in abundance, seemed to have been selected for homes. We read in Bible history, and in later times in histories of foreign countries, that fish formed the principle article of food."

"The parts of the fish used for food are the strips of muscle lying along the backbone on each side from the head to the tail. In white fish this muscle is white, except in herring and mackerel."

"Freshness of Fish. This cannot be too largely overestimated, stale fish being even worse than stale meats."

"Baked fish is a convenient method to use in school cooking."

"Pupils may bring in samples of baking-powder and test the smoothness, and also the effervescing powder."

"Lemons in Tea. There are sugar and vegetable acids in both lemons and tea, so the effect is the same. Both are changed into CO_2, which is not supposed to be wholesome."

"There should be a care to make the table and food pleasing to the eye."

Some Living Things; First Lessons in Physiology. Ella B. Hallock, A.S. Barnes and Company, New York. Pp. 213.

The author has presented material in response to a number of needs, three of which she states, as (1) To study the human body in relation with other living things, and the things on which it depends for life; (2) to teach about the human body in such a manner and in such relations that the pupil will be interested in the structure and work of its different parts; and (3) to offer the material in the form of lessons conveniently arranged for the busy teacher.

Throughout the book, the method used is that of direct questioning and the requirement of answers written in a specified number of formal statements. The author does not state the grades she had in mind in the preparation of the lesson. The subject matter given is quite simple enough to be grasped by children in the second and third grades, but the method suggested certainly could not be employed below the fourth. Even then, if not skillfully handled, the work would easily fall into formal and lifeless question and recitation.

In the first three lessons, by means of pictures, questions, and written answers, is developed the idea of the differences between things alive and lifeless, also between plants and animals.

This is followed by the lessons on "principal parts." Almost one-fourth of the book is given to this phase of the work. An attempt is made to consider separately each exterior part of the human body in connection with a similar part of the body of other animals. Accordingly, the children study in isolation and by means of pictures of the dismembered part, the arm of a man, the fore-limb of a horse, the arm of a monkey. This leads to a study of the skeleton arm and hand, the counting of the bones, the study of the muscles, then to the work and care of the hands. The leg, foot, trunk, head, and neck are similarly studied. After thus breaking the body up into numerous and definite parts, there is no attempt made to bring them together into the form of a living, active being. The child is not given the joy of feeling that these parts do not really exist as pieces, but that they are all wonderfully put together to make one beautiful, harmonious whole. Accordingly, the book is decorated on every page with pictures of severed legs, hands, fingers, and feet; beheaded horses, cows, and men; detached ears, noses, and eyes. The attempt has been made to write down to the child's level, but the desire to help the busy teacher is in many cases more vividly reflected than the desire to give to the child every opportunity for individual thought and free expression.

The third general division of the book is given to the study of the organs of special sense and speech. Here, in the discussion of the skin, mouth, nose, eye, and ear, the same methods of presentation and illustration are used.

Under "principal need" are treated the subjects of air, food, water, sunshine, clothing, work and rest. In these lessons the writer seems much nearer the interests of childhood, while the picture story about the little girl who loved the wind, water, play, and good food, adds interest and life to the entire chapter.

Temperance teachings, a fifth division of the book, is suggestive and helpful. Instead of following the line of old formal temperance teaching, the social and civic aspects of the subject are given emphasis.

Emergencies is the subject of the concluding chapter. The suggestions given are simple and perhaps helpful, yet it is questioned whether such material holds a legitimate place in a book of so elementary a character.

Many of the chapters are concluded with quotations. In some cases these are well chosen—in others the quotations are not only distantly connected with the thought of the chapter, but wholly lacking in childish spirit and interest.

Certain good health rules are suggested throughout the book, and the children encouraged to pledge themselves to try to adopt certain ones. A pledge can mean very little to primary children, for whom the book seems to have been written. They are mentally unable to carry over experience in such a way as to be able to discriminate sufficiently to make and keep a pledge. Such a course of procedure with little people would certainly be lacking in genuine meaning and real dignity.

After all this is said, it still remains that the book has many points of excellence over the old works on formal physiology. The material is graphic, simple, attractively arranged, and in most cases, that in which the ordinary child finds daily interest. While the method is questionable, the book is rich in suggestive material, and in the hands of a resourceful teacher, might prove a valuable aid.

Scientific Cooking with Scientific Methods. Sarah E. Woodworth Craig. Cincinnati, 1911, pp. ix + 404.

A collection of recipes, with an introduction which discusses the composition and characteristics of food, and similar topics. This introductory material is neither very adequate nor well arranged. Referring to pectose as an acid is perhaps a slip of the pen.

The Preservation of Eggs. R. Berger. Reprint from *Journ. Ind. and Eng. Chem.*, 3, 1911, no. 7, July.

Inasmuch as various writers differ as to the relative merits of different preservatives for eggs, the author experimented with eggs in crystallized silicate of soda, or "alkasil," $Na_2O, SiO_2, 9H_2O$, and 4 grades of commercial silicate of soda varying practically between the formulas $Na_2O, 4SiO_2$ and $2Na_2O, 3SiO_2$. Caustic soda and lime were also added to silicate of soda high in SiO_2 in order to bring down the SiO_2 percentage.

No great difference was found in regard to the pore-sealing action of these different treatments, and it is believed that common silicate of soda gives satisfactory results. Directions for preserving eggs are given.

Special Problems in the Service of Food. Anna Williams. *Ill. Agr.*, 15 (1911), no. 7, pp. 25–29.

These problems deal chiefly with cost and time values. One of them is "How much variety can be secured simply by different methods of preparing the same food stuffs?" This article shows how the problem was solved.

What Salem Dames Cooked in 1700, 1800, and 1900. Salem, Mass., 1910, pp. 40.

This publication, compiled at the Esther C. Mack Industrial School, contains a number of old and modern recipes.

Tropical Agriculture and Cookery. Mrs. F. R. Ramsdell, Nueva Gerona, Isle of Pines. 1909, pp. 56.

The author has collected a number of recipes for the preparation of avocado, breadfruit, cashew apple, chayote, and other vegetable foods used in the Tropics. In the case of avocado or alligator pear the recipe includes directions for cooking the fruit as well as for serving it in the more usual ways, for making avocado pickle, and for extracting the avocado oil, which it is said does not readily become rancid and which can be used as an illuminant or for soap making.

Chocolate and Cocoa Recipes, Maria Parloa, and **Homemade Candy Recipes,** Janet McK. Hill. Dorchester, Mass., 1910, pp. 64, pls. 12, fig. 1.

A collection of recipes by the authors named and also a number gathered from other sources. Some historical and other data regarding cocoa and chocolate are also included.

The Feeding of School Children. Helene Simon. Die Schulspeisung. Leipsic. 1909, pp. viii + 93.

Pioneer work in the feeding of school children, the conditions which must be met, and other questions are discussed with reference to work in Germany and other countries.

Invalid Dietetics. Emilie Kieslinger and K. Wirth. Die Krankenkost. Munich, 1910, pp. x + 250.

General questions of digestibility and similar topics are discussed as are also special problems of invalid dietetics and children's diet, and many recipes are given for the preparation of foods.

The Hospital Dietition. W. F. Boos. *Boston Med. and Surg. Jour.*, 162 (1910) No. 12, pp. 386, 387.

The importance of this subject is pointed out, some of the duties of the dietitian outlined, and suggestions made for establishing a course in hospital dietetics, in a paper which was read before the section on institution management at the second annual meeting of the American Home Economics Association, Boston December 31, 1909.

How to Live on a Small Income. Emma C. Hewitt. Philadelphia, 1909, p. 208.

The selection of a home, health problems and sanitation, furnishings and their care, economy in work, economy in the preparation of food, and other questions are discussed.

Housekeeping in Switzerland. Mary Swift Anderegg. *Ohio Farmer*, 128 (1911), no. 14, p. 284, fig. 1.

An interesting summary of data regarding market conditions, food supply, and similar topics.

Some Points in Choosing Textiles. Charlotte M. Gibbs, *Univ. Ill. Bul.* 8 (1910), no. 15, pp. 18, figs. 5.

The author gives directions for choosing cotton, linen, woolen, worsted, shoddy, and silk materials, and in conclusion summarizes the methods of adulteration most likely to be found and the tests for them.

Chemistry for Launderers, also for Cleaners and Dyers. C. F. Townsend. Chicago, 1910, pp. 189, figs. 5.

In this revision of an English work it is stated that changes have been made to bring the discussion into harmony with American customs. Soaps, acids, bleaching, stains and their removal, fuel, fabrics, dyes and dyeing, the chemistry of the wash room, and similar topics are discussed, and directions are given for some simple analytical work.

Home Waterworks—A Manual of Water Supply in Country Homes. C. J. Lynde, New York, 1911, pp. xii + 270, figs. 106.

Teacher and student will be interested in this handbook, which the author considers suitable for reading and study by children in continuation classes and in high schools. General questions of water supply are considered and also problems of bringing water into the house, methods of pumping, plumbing and sewage disposal, water power, and related matters.

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